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ANALYSIS OF INSTITUTIONAL MECHANISMS THAT SUPPORT COMMUNITY RESPONSE TO IMPACTS OF FLOODS AND DROUGHT IN THE MIDDLE-ZAMBEZI RIVER BASIN, ZIMBABWE

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In collaboration with

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A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Integrated Water Resources Management of the University of Zimbabwe

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DECLARATION

I, **Park Mc Millan Ndawa Mapunda Muhonda**, declare that this research report is my own work. It is being submitted for the degree of Master of Science in Integrated Water Resources Management (IWRM) in the University of Zimbabwe. It has not been submitted before for any degree of examination in any other University.

Date: _____

Signature: _____

Contents

List of tables

List of figures

Acronyms

AGRITEX	Agricultural Research and Extension
BH	Borehole
CAMPFIRE	Communal Area Management Program for Indigenous Resources
CBAT	Community Based Action Team
CPO	Civil Protection Organisation
DA	District Administrator
DCP	Department of Civil Protection
DCPPC	District Civil Protection and Planning Committee
DDRC	District Drought Relief Committee
EMA	Environmental Management Agency
FAO	Food and Agricultural Organization
FEWS NET	Famine Early Warning Systems Network
FGD	Focus Group Discussion
GDP	Gross Domestic Product
HFA	Hyogo Framework for Action
HH	Household
IKS	Indigenous Knowledge Systems
IPCC	Intergovernmental Panel on Climate Change
IRIN	Integrated Regional Information Networks
ITCZ	Inter Tropical Convergence Zone
IWRM	Integrated Water Resources Management
LGDA	Lower Guruve Development Association
MET	Meteorological Services
MGD	Millennium Development Goals
MLGPWUD	Ministry of Local Government Public Works Urban Development
MPSLSW	Ministry of Public Service Labour and Social Welfare
MZV	Middle Zambezi Valley
NCPPC	National Civil Protection and Planning Committee
NDRC	National Drought Relief Committee
NEPC	National Economic Planning Commission
NEWS	National Early Warning System
NEWU	National Early Warning Unit
NGO	Non-Governmental Organization
NR	Natural Region
PA	Provincial Administrator
PDRC	Provincial Drought Relief Committee
RDC	Rural District council
SADC	Southern African Development Community
SARCOF	Southern African Region Climate Outlook Forum
SPSS	Statistical Package for Social Science
UNDP	United Nations Development Programme
UNISDR	United Nations International Strategy for Disaster Reduction
UNOCHA	United Nations Office for Coordination of Humanitarian Affairs
VDC	Village Development Committee

WDC	Ward Development Committee
WMO	World Meteorological Organization
WVZ	World Vision Zimbabwe
ZINWA	Zimbabwe National Water Authority
ZRC	Zimbabwe Red Cross
ZRP	Zimbabwe Republic Police

DEDICATION

This piece of work is dedicated to my love Rhoda and my mother Fyness Nyakawamba Msiska

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I would like to acknowledge the guidance of Almighty God in this project. Lord God, You are my Shepherd. Teach me to love you more.

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ABSTRACT

In recent years, the frequency of droughts has been increasing in Southern Africa. In areas such as the middle Zambezi Valley's Manyame catchment, Zimbabwe, floods are also a frequent occurrence. Increase in the frequency of drought and flood is partly linked to climate change. Floods and droughts negatively impact on livelihoods of the poor. Both drought and floods reduce crop yields and can also affect livestock, which are the main sources of livelihood in the catchment. In response to these climatic events, governments within Southern Africa have formulated policies which try to mitigate the impacts of droughts and floods. This study analyses the institutional mechanisms at the local and national level which try to mitigate the impact of floods and droughts. The study employed focus group discussions, key informant in-depth interviews, and semi structured household interviews to gather primary data. Secondary data sources such as policy and legislation documents and operational manuals were also reviewed. Data analysis was done using a thematic approach and social network analysis using UCINET 6. Quantitative data were analysed using SPSS 13.0. The study found that the institutional framework that has been developed at the national and local level to support communities in the study area in response to the impacts of floods and droughts comprises mainly of National Civil Protection Policy, National Policy on Drought Management, Civil Protection Act of 1989 complemented by sector legislations, Civil Protection Organisation and traditional institutions. The study found that the institutional framework does not effectively strengthen disaster management mechanisms in Kanyemba. Local institutional structures in Kanyemba lack material, financial, and appropriate training and skills to undertake floods and drought management activities to effectively mitigate the impacts of floods and drought. There are inadequate observatories in Kanyemba for monitoring meteorological and hydrological conditions to accurately forecast floods and drought. In addition the community has difficulties accessing floods and drought early warning in time due inadequate communication systems. The study concludes that the capability of the institutional framework in Kanyemba to effectively support community management of floods and drought is limited.

CHAPTER 1

INTRODUCTION

1.1 Introduction

Floods and droughts are the most devastating natural hazards in Southern Africa eroding the development capacity and livelihoods of the majority of the poor and weakening their coping and survival capacities (Mirza, 2003; Chenje, 2000). According to World Bank (2008) floods and drought account for 70% of economic losses linked to natural hazards in Southern Africa. Over the last twenty years, the occurrence of floods and drought in the region has increased significantly (Mirza, 2003). Studies predict that the ongoing process of climate change will result in increased intensity, and frequency of floods and drought in the region.

With a few exceptions, droughts occur in most parts of the southern Africa. Drought tends to cause extensive damage to crops and adversely affect livelihoods through food shortages. Other major impacts of drought include shortages of water and a decline in the environmental conditions of an area. Drought also impacts on economies since in the region most economic activities tend to be based on agricultural commodities. According to the World Bank (2005) the drought that occurred in the region in 1991-92 reduced the Gross Domestic Product (GDP) of Zimbabwe and Zambia by about 10%. This decline occurred because economic activities in the countries are intricately tied to agriculture.

In the middle Zambezi floods are not only a result of high precipitation, but they are also related to the operation of dams in the Zambezi River Basin. Increased occurrence of floods in the region causes destruction of property, crops and livestock, loss of livelihoods, displacement of communities and also induces spread of water borne diseases. Floods hinder socio-economic development of the region. For instance the floods in the year 2000 in Mozambique cost an estimated $550 million and lowered the GDP growth rate from 7.5 to 1.5% (World Bank, 2005).

In light of the impacts floods and droughts on development in the region, the Southern African Development Community (SADC) which is a regional body, and governments in the region are

taking a pro-active approach to disaster management, with a focus on mitigating the impacts of floods and drought. Policy and legislative frameworks and institutional platforms for management of floods and droughts through the entire cycle of comprehensive disaster management (mitigation, preparedness, response and recovery) have been developed at the regional SADC level and in many countries in the region, at the national level. However, the effectiveness of such regional, national and local institutional mechanisms for management of floods and droughts at community level has not yet been adequately assessed and the practical effect of these institutional frameworks merits further investigations.

It is against this backdrop that this study analyses the effectiveness of policy, legislative frameworks and institutional mechanisms at, national and local level that support communities' response to the impacts of floods and droughts. A case study of Kanyemba community, which is in the middle Zambezi basin, and administratively in the Mbire district, Mashonaland Central Province, Zimbabwe, will be used to provide an in-depth analysis of the effectiveness policy, legislative frameworks and institutional mechanisms for floods and drought management

1.2 Problem statement

The middle Zambezi Valley lies in a region with high climate variability and prone to extreme weather events (Madamombe, 2006). Poor rural communities in the area face recurrent floods and droughts that are impacting on the natural resources on which the communities depend (Gwimbi, 2009). This creates a potential for more problems and an uncertainty for livelihoods as well as in the area. In response to impacts of floods and drought on sustainable development in the region, SADC and governments in the region Zimbabwe in particular has put in place institutional mechanisms to try to reduce the impact of these devastating natural events to the communities in the region. This study therefore seeks to assess the effectiveness of institutional mechanisms that support communities' response to the impacts of floods and drought in the middle Zambezi valley, Kanyemba community.

1.3 Significance of the study

Analysis of the policy and institutional mechanisms for supporting communities' response to impacts floods and droughts in the Lower Middle Zambezi Valley will help to identify gaps and areas of good practice in the framework for management of floods and droughts. The study will provide valuable information for improving policy and institutional mechanisms to better support and build communities' resilience to the impact of floods and droughts in the country. The knowledge gained in the study will be valuable for other countries in the region as well. The study finding of the study can potentially contribute to the attainment of the MDGs and ideals of social equity, and environmental sustainability for the region as promulgated by Integrated Water Resources Management (IWRM).

1.4 Research questions

- What are the impacts of floods and droughts on livelihoods in Kanyemba?
- What institutional mechanisms are there to mitigate the impact of floods and drought?
- How do the institutional mechanisms function?

1.5 General objective of the study

The general objective of the study is to assess the effectiveness of institutional mechanisms that support communities' response to the impacts of floods and droughts

1.6 Specific objectives

- to analyse the impacts of floods and drought on livelihoods of the communities in the Middle Zambezi Valley
- to analyse the national and local community policy and legislative framework and institutional structure that support a community level management of floods and drought
- to assess the effectiveness of the national and local community institutional mechanism in supporting the communities' management of floods and drought

1.7 Structure of the thesis

This thesis is structured as follows:

Chapter 1 introduces the study. It gives a general view of drought and floods in Southern Africa and the regions response to these disasters. The chapter further presents the problem statement, significance of the study, research questions and objectives of the study.

Chapter 2 reviews literature on floods and drought. It gives an overview of floods and drought and their causes, occurrence and impacts of floods and drought in Southern Africa, community vulnerability and resilience to floods and drought; floods and drought management in Southern Africa and finally presents the comprehensive framework for effective flood and drought management framework.

Chapter 3 is on the methodology employed to carry out the study is described. The chapter starts with an overview of the study area. After that the methods used for data collection and analyses are presented.

Chapter 4 presents the findings of the study. The results are also discussed in the same chapter.

Chapter 5 presents conclusions drawn from the findings and makes recommendations.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter reviews literature on floods and droughts. The chapter opens with an analysis of the definition and causes of drought as found in literature. It proceeds to analyse floods and drought in Southern Africa. The chapter further considers concepts of community vulnerability and resilience with regards to floods and drought. The chapter then analyses the state of floods and drought management in Southern Africa. Finally it reviews comprehensive disaster management framework.

2.2 Defining floods and drought.

Floods

A flood is an unusual high-water period in which water overflows its natural or artificial banks onto normally dry land (UNDP, 2009). Floods are generally classified according to their duration that is flash floods, and rapid onset floods or according to their location that is river floods, and coastal floods (UNDP, 2009).

The main cause of flooding is abnormally high rainfall which making the banks of the river unable to contain the high flows due to heavy rainfall which may be triggered by cyclones. However floods are also induced by human activities such as land degradation, deforestation of catchment areas, increased population along riverbanks, inadequate and poor land use planning (Madamombe, 2006). These anthropogenic factors accentuate erosion and silting of the river beds, resulting in a reduction of the carrying capacity of river channels leading to changes in river courses and obstructions to flow (UNDP, 2009)

Drought

There are different perspectives on drought and this give rise to a large number of definitions (Wilhite and Glantz, 1985; Giambelluca and Swearingen, 1992; Hazelton, Pearson and Karluki,

1994; Nullet and Nullet, 1998; Jackson, 2001; Pelser, 2001; UNISDR, 2003). The many definitions of drought arise because the characteristics and the impact of droughts differ at local, regional and national scale (UNISDR, 2003)

According to Wilhite and Glantz (1987) there are three main types of drought: meteorological, hydrological, agricultural and socioeconomic drought. Meteorological drought is defined as the deficiency of precipitation from expected or normal amount over an expected period of time. According to Unganai and Bandason (2005) no objective operational definition of drought has been developed in Zimbabwe but drought is said to exist when rainfall is less than 75% of the long term average for a prolonged period during the rainy season. A drought is declared according to the result of an assessment of the state of agricultural production and water supplies. If these have been adversely affected to the extent that small farmers cannot cope without state assistance, a drought is declared (Unganai and Bandason, 2005)

Hydrological drought refers to a rainfall deficit capable of seriously reducing runoff, stream flow, inflow into storage reservoir and recharge of ground water (Whitmore, 2000) It associates the effect of periods of precipitation shortfalls on surface or subsurface water supply. The frequency and severity of hydrological drought is often defined on a watershed basin scale (Wilhite and Glantz,1987) Although climate is a primary contributor to hydrological drought, other factors such as changes in land use affect the hydrological characteristics of the basin

Agricultural drought occurs when an insufficiency of soil moisture causes crop failure (Wilhite and Glantz, 1987; Wilhite, 1997; UNISDR, 2003). This type of drought occurs when plant water demand cannot be met due to inadequate soil moisture resulting from dryness brought on by meteorological or hydrological drought. In such cases plant water stress is shown by reduced biomass and plant yield (Jackson, 2001).

The meteorological, agricultural and hydrological droughts are interlinked (Figure 2.1) (UNISDR, 2003). Meteorological drought occurs first followed by agricultural drought and then hydrological drought (Wilhite, 1997). In a prolonged drought event the hydrological system recovers last. The relationship of agricultural and hydrological drought to meteorological drought may not be apparent in some cases.

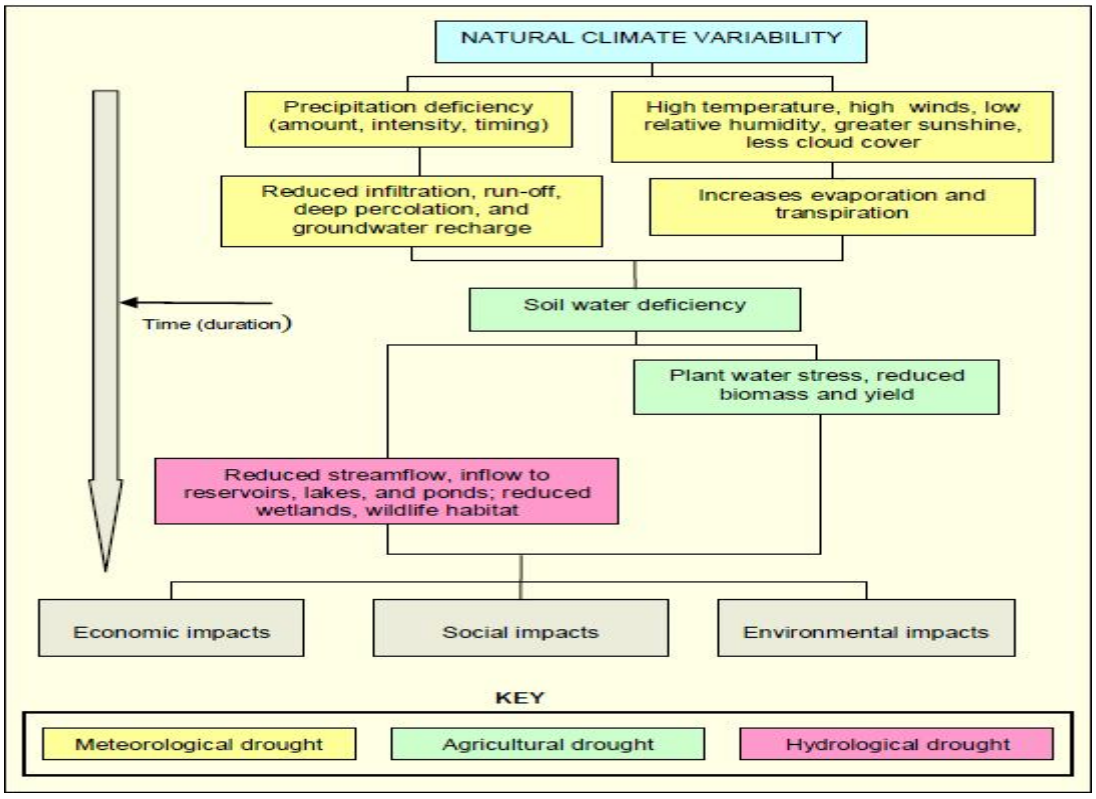

Figure 2. 1: Relationship between types of drought: Adapted from NDMC 2006

There is no single explanation for the cause of drought. Occurrence of drought in Africa in the 1980s and 1990s has been linked to the El Nino-Southern Oscillation (ENSO) phenomenon which causes large scale disruptions such as occurrence of anticyclones in the atmospheric circulation (Wilhite, 2000). When an anticyclone or a high pressure system remain over an area for a prolonged period during the rainy season dry weather conditions may be experienced. In Southern Africa, for example, occurrence of a high pressure system (anticyclone) referred to as the Botswana Upper High over the region in summer prevents the Inter Tropical Convergence Zone (ITCZ) from moving into the area thus reducing the convergence of air masses that bring rainfall to the region resulting into drought over most parts of the region (Unganai and Mason, 2002).

2.3 Floods and drought on a global scale.

Floods and droughts are the most severe natural disasters confronted by human being. World-wide the frequency of occurrence of floods and droughts and their negative impacts that usually cause heavy property losses and casualties is on the rise (UNISDR, 2009). According to statistics of the United Nations, from 1991 to 2005, more than 3,300 floods, and droughts were reported all over the world, accounting to 64% of all natural disasters. The affected population of these disasters reached 3.4 billion, accounting for 98% of the total population affected by natural disasters.

Due to their geographic and climate conditions, some regions are more vulnerable to severe floods and droughts (World Bank, 2005). Asia for example overtakes all other continents in terms of the number of floods and droughts which all amount to nearly 40% of the world total. Thus Asia is one of the regions in the world is most affected by floods and drought disasters.

However regions and countries differ in their capacity to effectively prepare for and respond to the effects of floods and drought. Thus the number of people affected by floods and drought and the types of impacts experienced vary by region or country (UISDR, 2009). For instance in the Asian region, in particular, India and China recorded the largest number of people affected by drought from 1980 to 2006. However, for the same period, it was Africa that recorded the largest number of peopled killed due to the catastrophic droughts in Ethiopia, Sudan and Mozambique in the 1980s

In Africa, floods and drought are the major natural hazard causing threats to people's livelihoods and community socio-economic development. Disasters originating from floods and drought in Africa not only affect tens of millions of people but also contribute to famine and starvation among millions of people, particularly (World Bank 2005). In Southern Africa, droughts and floods are a common feature and their co-existence poses a threat, which cannot be eradicated but has to be managed. Despite significant achievements in science and technology in the 20th century poor rural communities still continue to suffer the consequences of severe floods and drought in the region

2.4 Floods and drought in Southern Africa

Occurrence of drought and floods in Southern Africa

Drought has been a occurring almost every 4-5 years in most parts of the region since the early 1980s. Most part of the region were hit by severe drought in 1981-84, 1986-87, 1991-92 1994-95, 2001-02, and 2006-07 (Russell, 2008). Studies point out that the ongoing climate change process will result in increased intensity, frequency of hydro-meteorological extreme events such as drought and flood the region (World Bank 2008). Over the last twenty years some parts of the region has experienced severe flooding. Most notably are the floods in the year 2000 in Mozambique. Both floods and drought have devastating impact on the region (World Bank, 2008).

Impacts of drought and floods in Southern Africa

Drought is the major threat to sustainable development in Southern Africa. They severely affect the livelihoods of the people in the region. According to World Bank (2008) they account for 70 percent of economic losses linked to natural hazards in the region. The drought of 1991/92, in Zimbabwe for example, reduced the GDP by about 10% (World Bank, 2005). Prolonged drought also leads to chronic, recurrent food insecurity and persistent threats of famine among millions of people in Southern Africa. In 2002-03, an estimated 13 million people faced food shortages as a result of severe drought in Southern Africa (Tango International, 2005). According to Chenje and Johnson (1996) drought in the region also tend to have severe environmental and social impacts. They aggravate environmental degradation through deforestation, livestock overgrazing, wild fires, and biodiversity loss. Social effects include reduced potable water supplies with a higher burden on women who collect water for household consumption and migration pressures (UNISDR 2008).

Floods in the region threaten people's lives, their livelihoods and hinder socio-economic development. In the year 2000 devastating floods in Mozambique cost an estimated $550 million and lowered GDP growth rate from 7.5 to 1.5 percent (World Bank, 2005). As a result of floods in the region crops and livestock are washed away leading to food insecurity and loss of livelihoods. In addition, houses and other infrastructure, such as roads, are damaged. The consequences of this are that communities have been forced to leave their homes and move to

areas where they do not have access to basic services, such as health clinics and schools. Another hazard of floods in the region is that accessible water is contaminated by debris, sewage or even decomposing animal corpses, which increases the risk of outbreak of diseases such as cholera (Madamombe, 2006). However the severity of the impact of both floods and drought on the community is directly related to vulnerability of the community (Blaikie *et al*., 1994)

The middle Zambezi River basin

The Zambezi River basin located in Southern Africa is the fourth-largest river basin of Africa, after the Congo/Zaire, Nile and Niger basins. Its starts in the Kalene hills in Zambia and flows through Angola, along the borders of Namibia, Botswana, Zambia again, and Zimbabwe, to Mozambique, where it empties into the Indian Ocean. Its middle part is considered to be the stretch starting from the Victoria Falls up to where it enters lake Cahora Bass. The middle Zambezi is shared mainly by Zimbabwe and Zambia. This study however focuses on the Zimbabwean side. the Middle Zambezi River basin is generally low lying with an escarpment to the South forming a significant feature. The area is endowed with indigenous forests as well as numerous species of wildlife.

The Middle Zambezi Basin mainly falls in Natural Region VI (which received about 400-600 mm of annual rainfall) and Region V (which receives less than 400mm of rainfall annually). Hydro-meteorological disasters are not a new phenomenon in the middle Zambezi River basin. There has always been drought and flooding in this area, but in recent years weather patterns have become more unpredictable. Rainfall is erratic and there have been more frequent floods and droughts. According to Chenje (2000) the basin since 1980s experience at least three drought seasons in a decade. Several drought and floods have afflicted the basin in recent years. For example 1986/87, 1991/95, 1997/98 and 2003/04 are some of the recent drought years while the past two decades saw the basin experiencing some of the worst floods. Floods in the basin are also exacerbated by operation of the Kariba and Cahora Bassa Dams which directly affects the water and environment situation in the area. Reservoir operation related floods from these two dams create a throwback effect that increases the vulnerability of the land area below the escarpment to flooding.

Occurrence of drought and floods in the basin negatively impact on food security and livelihoods. The people who live in the middle Zambezi region are largely subsistence farmers who rely on rain-fed agriculture. Irregular weather patterns which result in drought and floods in the basin undermine their ability of the rural communities to produce food and generate income. Dry spells and increased occurrence of drought in the compromise food security and livelihoods by reducing crop yields. Food and livelihoods situation is worsened by floods most of which are cyclones induced, destroying infrastructure and property, displacing people and wildlife and damaging crops. Communities in the basin thus region need help to adapt to the changing circumstances they face

2.5 Community vulnerability to floods and drought

Vulnerability is the degree to which an area or people are susceptible to, and unable to cope with, adverse effects of a hazard. Vulnerability involves a combination of factors: exposure to recurrent floods and drought and adaptive capacity (IPCC, 2007). Exposure is defined by the magnitude, character and rate of floods and drought in a given geographical area. Adaptive capacity of a community is its ability to adjust to floods and drought, to moderate or cope with impacts, and to take advantage of the opportunities that may arise with floods and drought (IPCC, 2007). Blaikie (1994) posit that effective institutional mechanisms are key to enhancing the adaptive capacity of a community to impacts of floods and drought.

2.6 Community resilience to floods and drought

Resilience is the measure of the capacity of the community to absorb and recover from hazards event (Blaikie 1994; Parry *et al*., 2007). Twigg (2007) defines a disaster-resilient community as a community which has the capacity: to absorb stress and destructive forces through resistance or adaptation; to manage or maintain certain basic functions and structures during disastrous events; and to recover or 'bounce back' with specific behaviour, strategies and measures for risk reduction. On the other hand a vulnerable community is unable to cope with, adverse effects of a hazard. and adapt to the changing climatic conditions.(IPCC, 2007).

According to Geis (2000), the disaster resilient community is the safest possible community that has the knowledge to design and build in a natural hazard context. It seeks to minimise its

vulnerability to such hazards as floods and drought by maximizing the community capacities through effective institutional mechanisms (Twigg, 2007). According to Twigg (2009) the community which has the following elements can be considered as resilient to future disaster risks: Community-based organisations with trained volunteers; hazard, vulnerability and capacity assessment done and socialized in the community; community risk reduction plans formulated and implemented; involvement of women, children and vulnerable groups in decision-making processes; integration of community plans into local development planning; community awareness on key hazards, their vulnerabilities and capacities, and future disaster risk; diversified local economy; contingency plans; and community early warning system linked to government early warning system.

2.7 Flood and drought management in Southern Africa.

At a regional level disaster management including the management of floods and drought has been an important component of the overall Southern African Development Community (SADC) strategy for regional development (World Bank, 2008). SADC has put in place institutional arrangements for management and reduction of the impacts of disasters such as floods and drought that are recurrent in the region. The institutional mechanisms by the SADC for flood and drought management includes the SADC Water Sector Coordinating Unit which has developed the SADCC disaster management strategy to strengthen flood and drought management in the region; SADC Regional Early Warning Unit which develops information on flood threats, drought conditions and food security.

At a national level however floods and drought management vary from one country to another. According to World Bank (2008) reporting on the status of flood and drought management in Sub-Saharan Africa most countries in the region have institutional frameworks in place for the management of floods and drought. However, the institutional frameworks that exist in different countries in the region tend focus on response mechanisms. The national policy and legislation for such countries as Malawi, Zambia, and South Africa centre on prescriptions for the functions, management and related institutional issues of the national disaster management organizations. Little emphasis is put into integration of disaster risk reduction in the response and overall

management of floods and drought. Halloway (2003) also points out that the instructional framework for floods and drought management in most countries in the Southern Africa do not emphasize sustainable efforts to reduce disaster vulnerability. Floods and drought management in Southern African countries is highly reactive and relief oriented (Halloway, 2003).

Effective floods and drought management however roots itself in driving down prevailing vulnerability conditions through ongoing development programmes which enhance mitigation and preparedness, rather than limiting itself to a major response once a crisis becomes apparent (Holloway, 2003). To best support communities to build resilience and effectively respond to impacts of floods and drought thus requires comprehensive institutional frameworks that focus on building anticipatory capability that reduces disaster proactively. There is need therefore for countries in Southern Africa to enhance the institutional frameworks and adopt new approach to disaster management. There is abundant compelling literature on new and effective approaches to disaster management.

2.8 New approach to floods and drought management

Disaster management including management of floods and drought has experienced a paradigm shift (Halloway 2003). An approach of just responding to emergencies when a flood or a drought event occurs that is instigating search and rescue and meeting survival needs after an event is now changed. Disaster management is now a comprehensive process that involves: mitigation, preparedness, response and recovery. Mitigation or prevention: refers to the long range pre impact activities of structural and non structural nature that tend to be designed to reduce the effects of disasters or actually eliminate or reduce the probability of occurrence of disaster or help to redistribute the cost of disaster impacts (UNISDR, 2005). Preparedness: refers to pre-impact activities concerned with preparing for disasters. Preparedness measure are close to the onset of impact than mitigation ones and are aimed at improving the emergency time response if a disaster were to occur. Response: deals with actions that follow a disaster impact. Recovery; covers those disaster relevant activities that are undertaken after the emergency period is over in an attempt to return to relatively normal functioning (UNDP 2005; Burton *et al*., 2002; Quarantelli, 1992). This new approach to flood and drought management thus focuses on

achieving resilience of communities through the disaster management cycle. The approach is represented graphically in figure one below. This disaster management process can be used as guidelines for a proactive national policy and institutional disaster management framework (Karluki, 1994)

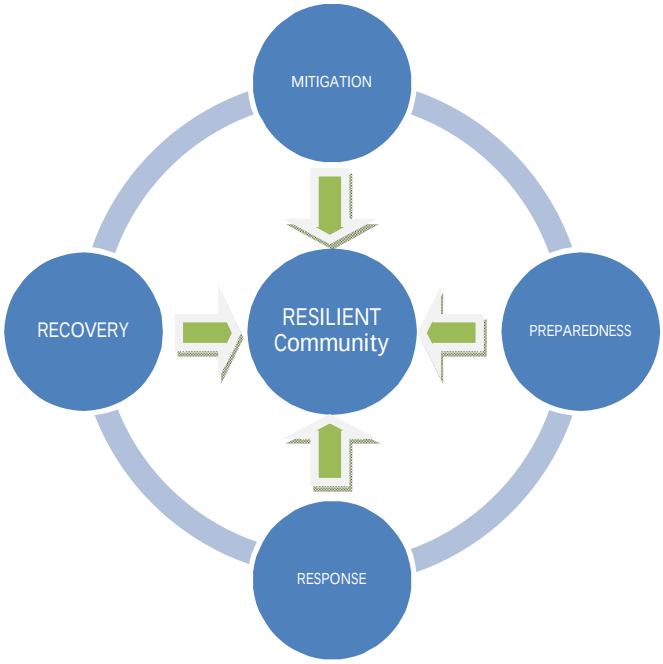

Figure 2. 2: Comprehensive flood/drought management process: Adopted from UNDP 2005

Implementation of comprehensive disaster management programs, however, requires an effective disaster management framework. Regional, national as well as local policy, legislative and structural frameworks play a key role in identifying and developing an enabling environment and adaptive interventions that help to build the resilience of communities to the impacts of floods and droughts (Kusumasari *et al.*, 2010; Huq, 2005; Sahoo, 2005).

With appropriate and effective institutional frameworks, comprehensive drought and flood management activities - mitigation, preparedness, response and recovery are focused, strategic and easily coordinated (Sahoo, 2005; López, 2008). Such a framework is able to explore the complex, cross-cutting and multi-faceted nature of vulnerability and identifies appropriate, proactive risk management solutions (UNISDR, 2009; Sahoo, 2005 UNISDR and UNOCHA, 2008).

A flood and drought management framework includes: policy and legislative framework, coordinated institutional set up and the appropriate flood and drought management programs (UNISDR 2009). This is illustrated by the model in Figure 2.3.

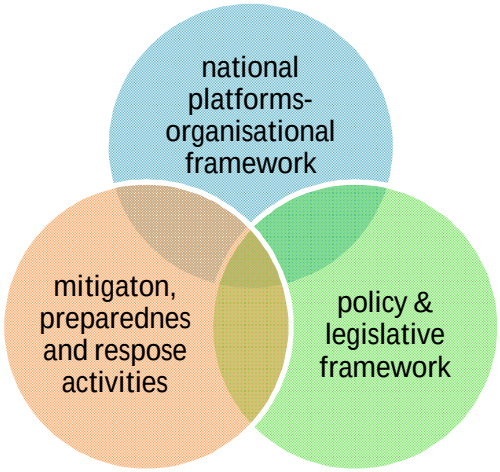

Figure 2. 3: Model of floods/drought management framework: Adapted from UNISDR 2009

This model however is weak in that it represents policy and legislative framework, organisational mechanisms and protection and response activities as three spheres with some overlaps. Some would argue that to be successful floods and drought management activities and the institutional organisational mechanisms should be embedded and supported by the policy and legislative framework and that a more viable model would be the one represented in Figure 2.4 below:

Figure 2. 4: Proposed model of flood/drought management framework

2.9 Summary

This chapter has shown that drought and floods have negative impacts on livelihoods and development of communities in Southern Africa. However it has pointed out that severity of the impacts of floods and drought can be related to capacity of the communities to manage them. The chapter has indicated that countries in Southern Africa have weak institutional capacity for e management of floods and drought as they are reactive and relief oriented. It has elaborated that effective management of floods and drought is rooted in driving down the prevailing vulnerability conditions by building the anticipatory capacity of communities that reduce disaster proactively. It has finished by presenting framework for comprehensive flood and drought management

CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter presents the study area and the methods which were used to gather data.

3.2 Study area

The study was carried out in Kanyemba, Zimbabwe. Zimbabwe is a landlocked country located in Southern Africa. It has a subtropical climate. The country lies in a region with limited and unreliable rainfall patterns and has national mean rainfall of 655mm with low lying parts of the country receiving less than 300 highland areas receiving over 1000mm (Muir 1994). The rainy season extends from November to March with a peak in January. The rainfall regime is predominantly convection associated with Inter Tropical Convergence Zone (ITCZ) Drought is one of the major features of Zimbabwe's climate. On average two to three drought occur every ten years in Zimbabwe (1996, Chenje 2000, WMO 2000, 1994, Russell, 2008,)

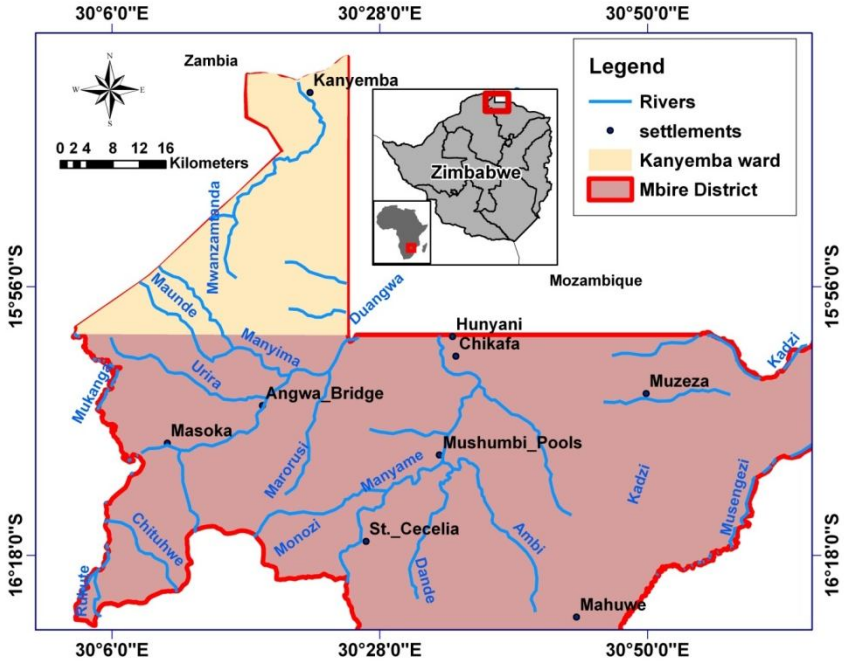

Figure 3. 1: Location of Kayemba

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Kanyemba is a rural community in Mbire Rural District one of the eight administrative districts of Mashonaland central province that was formerly known as Lower Guruve. The Mbire Rural District Council located at Mushumbi Pools was established on the 5th of July 2007 after Guruve Rural District Council was split into 2 districts. Kanyemba is in the northeast of the district at the meeting point of the Zimbabwean, Mozambican and Zambian borders. It is one of the most remote and underdeveloped area in Zimbabwe. There is poor road infrastructure. All parts of the community are linked by dirt roads that have gone for years without maintenance. there are no communication infrastructure such as telephone in the area. The area is not served with power-electricity. Kanyemba is Ward 1 of 17 administrative wards, each with an elected councillor in Mbire Rural District. Traditionally Kanyemba fall under the jurisdiction of Chief Chapoto. The traditional‖ leadership is hierarchically structured: Chief, headmen and village heads who form part of local traditional system. Inhabitants of Kanyemba are mainly the VaChikunda Chief Chapoto is the head of the VaChikunda people.

Livelihoods in Kanyemba

Kanyemba is a remote marginal communal land which is not suitable for agriculture. People in the area have inhabited rocky area which is not suitable for agriculture. Despite poor soils, scarce rainfall, lack of draught power and high levels of crop raiding by wild animals, most people in Kanyemba rely on smallholder agricultural production for both subsistence and cash income. Main crops grown include maize, sorghum, millet, groundnuts, cowpeas, sweet potatoes, and cotton. Maize is the staple. Cultivation takes place both on upland fields and in the low lying areas along the Mwanzamtanda River where there is rich alluvium soil in the rainy season and during the dry winter months. In the dry winter months people continue cultivating in the low lying areas along the Mwanzamtanda River on the rich alluvium soils using residual flood water in the river sand. This is locally known as “dowe,”- stream bank cultivation. Dowe is especially important as a survival strategy against drought conditions of the area. The area is infested with tsetse fly which hinder keeping of livestock. Goats are the only main livestock kept in the area as they are resistant to diseases transmitted by tsetse fly. Employment in the tourism related activities and fishing are also part of the local uses of resources, which contribute to livelihood strategies in Kanyemba People in Kanyemba are also involved in business within the community and also with neighboring Mozambique and Zambia as a source of livelihood

Climate

The climate of the Kanyemba is characterised by low rainfall and high temperatures. The temperatures vary little with annual average of 25 C. October and November, which precede the arrival of the rains, are the hottest months with maximum temperatures of over 40 C, whereas June and July have a minimal temperature sometimes around 10 C. The annual rainfall for Kanyemba is between 450-650mm but it is highly variable and characterised with severe dry spells and frequent seasonal droughts The rainy season lasts a little over 100 days per annum between November and March, but with only around 40 days on which rain will fall. Mean annual evaporation is approximately 2 000 mm

Relief and Drainage

Kanyemba is a low-lying area with an average altitude of 400m above sea level. It has uneven topography with very shallow leptosols and lexisols soils. The Zambezi river forms the northern boundary of the study area and flows all year. Flow down this river is regulated by the Kariba Dam and Cahora Bassa Dam flood. Mwanzamtanda River along which the Kanyemba community is settled drain its water into the Zambezi downstream of the Kariba and up stream of the Cahora Bassa. Throwbacks in the Mwanzamtanda River which is a tributary that feeds into the Zambezi cause floods in the Kanyemba area. The Luangwa River in the Zambian side is an important tributary of the Zambezi which also influence flooding in Kanyemba as it confluence is directly opposite the Kanyemba area. In terms of hydrological boundaries in Zimbabwe Kanyemba falls under the Manyame catchment particularly the lower sub-catchment.

Vegetation and Wildlife

The area is **woodland with a** varied vegetation type characterised by dominance or co-dominance of *C. mopane* and *T. stuhlmannii.* Other typical tree species include *Combretum apiculatum, Kirkia acuminata, Erythroxylum zambesiacum, Commiphora mollis,* and *Acacia nilotica.* Mosquito and tsetse fly are insects in Kanyemba which have played their part in ensuring that the mid-Zambezi valley was lightly settled. More than 80 species of mammals have been recorded in area These species include big game such as elephant, lion, buffalo, leopard and cheetah which constitutes a big draw card for tourists. Area is also highly rich in birds with

nearly 300 species of birds recorded in Mbire district. These represent 34% of the species of birds in Zimbabwe and 23 % of the species in Southern Africa, including 20 protected species. Abundance of wildlife makes the area very important for tourism activities such as safari hunting industry. Wildlife resources and the forest in area are managed by the community itself under Communal Area Management Program for Indigenous Resources (CAMPFIRE) program. Through CAMPFIRE the community benefit from their natural resources through trophy hunting where concessions are sold to professional hunters and safari operators through set quotas. Individual hunters can pay as much as US$12,000 to hunt an elephant (AWF, 2011). Hunting is strictly monitored, accompanied by local, licensed professionals. The community generates a substantial income for the area through hunting which is used to fund development projects in the area such as schools, clinic, and grinding meals. The community also benefit through selling live animals, harvesting natural resources such crocodile eggs, caterpillars, timber, wildlife meat. Some local people are employed directly as guides or run local facilities for tourists

Demographic Indicators

According to a baseline survey report by Lower Guruve Development Association (2008), it has a total population of about 4500. There are 900 households. Thirty three percent of the households are female headed.

Drought and floods in Kanyemba

Kanyemba experiences periodic drought linked to the occurrence of a high pressure system (anticyclone) referred to as the Botswana Upper High. The occurrence of the Botswana Upper High in summer that is November to January prevents the Inter Tropical Convergence Zone (ITCZ) from moving into the area thus reducing the convergence of air masses that bring rainfall to the area and most part of the country (Unganai and Mason, 2002). In the recent past Kanyemba has also seen increased frequency of floods induced by cyclones. Flood in the area are also induced by operations of the major water reservoirs in the Middle Zambezi Basin which include the Kariba Dam, Cahora Bassa Dam and the Kafue Dam. Kanyemba lies downstream of the Kariba dam but upstream of the Cahora Bassa dam and along Mwanzamtanda River, a tributary to the Zambezi River. When the releases from Kariba coincide with peak flow in the

Mwanzamtanda back flow occurs in the Mwanzamtanda which floods the area (Madamombe, 2006).

3.3 Methods

The purpose of this research was to evaluate institutional mechanisms that support the communities' resilience to floods and droughts. The study employed qualitative research methods to gain an in-depth understanding of the situation in the river basin with regard to drought and flood management.

3.3.1Entry into the study area

I entered into the study area through the district administrator who directed me to the chief of the area where I sought permission to conduct research. The chief welcomed me and accepted that I could carry out research in the area. He then directed me to go to the ward councilor to explain the purpose of the study. The councilor also accepted the idea and assisted me to identify a person to work with as a research assistant. I was given accommodation in the community where I was staying throughout the field work.

Staying in the community and working with a community member made it easy for me as a researcher to interact with the people in the community and also easily identify the people with knowledge on issues I was investigating. Staying in the community also gave me easy access to key informants. I was also able to go and meet key informants in the evening when they were through with their daily activities. The people in the community were very friendly to me and they took me as their visitor at first, but later on accepted me as one of them. They freely gave me the information that I wanted. During the study, I interacted frequently with the local leadership, the elderly, the youth and different classes of people in the community**.**

3.3.2 Data collection methods

(i)Household Interviews

Semi-structured household interviews were used to collect data on the impacts of floods and droughts on the community and the institutional mechanism in the community for management of floods and droughts and their effectiveness. Households which were affected by floods and drought and have lived in the area more than ten years were purposively selected from each of

the 24 villages in the study area. The study was also designed to include female headed households, child headed households and households with old and sick people. The heads of household were selected for interviews. If the household had the father and mother alive both were interviewed. The household interviews sought to gather information on occurrence of floods and drought, main livelihoods, impacts of floods and drought on livelihoods, mechanisms for floods and drought management, how the institutional framework is supporting the community to respond to floods and droughts and their effectiveness.

(ii) Key informant interviews

Key informant interviews are qualitative, in-depth interviews conducted with selected individuals from the community with more knowledge about the subject area (Kumar, 1987). The purpose of key informant interviews was to collect information from a wide range of people with first-hand knowledge of the study area. Thus, to gain insight into effectiveness of institutional mechanisms that support for community management of floods and droughts a series of key informants interviews were conducted with the traditional community leadership local authorities local authorities; District Administrator of Mbire, the RDC Chief Executive officer, the councilor and staff from government and nongovernmental organisations involved in flood and drought management in the area. The list of key informants interviewed and the interview guides is presented in appendix 1. Key informants were selected using Expert Sampling Technique. Expert sampling is essentially a specific sub-case of purposive sampling. It involves assembling of a sample of persons with known experience and expertise in some area.

(iii) Focus Group Discussions

Focus group discussions (FGDs) are a rapid assessment, semi-structured data gathering method in which a purposively selected set of participants gather to discuss issues and concerns based on a list of key themes drawn by the researcher (Kumar, 1987). FGDs explore deep into issues and give a balanced view of issues. To gain the views of the community who are the ones directly affected by floods and drought, focus group discussions were used to gather information about the institutional mechanism and their effectiveness from different groups of people in the community. The focus groups included: a group of ordinary community members, a group of village heads and other local leaders, a group of primary and secondary schools pupils and a group of government officers in the area agricultural extension workers. Main issues discussed

included: community organisations involved in flood and drought management; capacity of the community organisations; early warning systems, awareness, information dissemination; coping and adaptation measures (mitigation); and preparedness and response

(iv) Field observations

Field observations were also employed to verify the responses obtained from interviews and the discussions. Transect walks were undertaken with members of the community who managed to show the researcher the extent of land that was flooded last year 2010, fields in the up land that were affected by dry spell which occurred in February 2011 while the researcher was doing fieldwork, the irrigation scheme which was damaged by floods. Members of the community were given an opportunity to draw maps which show the layout of the village and show the areas mainly affected by land prone by flooding and areas which are safe from flooding.

(v*) Challenges on the collection of primary data*

The methods employed for data collection in the field: observation, household interviews key informant interviews and focused group discussions posed some challenges. On a practical level, it was difficult to get all participants selected for focused group discussions together at the same time and place. This was especially so because the time when the study was conducted was the time when people were busy with cultivation in the field where some could stay the whole day cultivating and guarding their crops. The design was to gather information from diverse groups of people but this was not successfully achieved. There were also cases of dominance by some participants which limited the richness of the data in terms of diverse views. Some of the participants saw themselves as less knowledgeable and did not participate so much and some were afraid to express contrary views for fear of being punished. Due to the perception of the community, they thought that the interviews were done for purposes of food aid and other relief items. Participants in the interviews were hiding information and only give one sided information which showed only the negative part on how they impacted by floods and drought in order not to prevent aid from coming. Selecting “the right” key informants in the community was done with the help of the community leadership particularly the councilor which might not be representative of the different groups especially in terms of political view points. It was also difficult and challenging to reach and schedule interviews with busy and difficult to find

respondents such as the district administrator and the chief executive of the Rural District council. Since Shona and Chikunda are the local languages spoken languages in area where the study was conducted and the researcher does not know these two languages a field assistant from the community was employed for to translation. the interpretation during interviews and focus group discussions which were the main methods employed to gather data might not be exactly the same meant than the respondent's thought. Some important information might have been lost through the process.

Secondary data source

Review of secondary data sources

Review of relevant documents was done to assist in achieving the research objectives. Relevant policy documents, legislation documents, strategic plan documents and programme documents, reports, profiles, operational manuals were collected and reviewed

3.3.3 Sampling

Kanyemba, Ward 1 was purposively selected since it does experience both floods and droughts. Purposive sampling is a method of coming up with a sample selected in a deliberate and non-random fashion to achieve a certain goal (Kumar, 1987). To ensure that view point of all the categories of people in the society- female headed households, old or chronically sick people, male headed households- are adequately represented and also to involve participants who have best knowledge of the topic, purposive sampling strategy was also employed to select participants for the household interviews and focus group discussions. Community members who have stayed in the area for more than ten years, who were greatly affected by the floods in 2010, female headed households, and the elderly were identified with the assistance of the local leadership and the research assistant. To elicit information of institutional mechanism expert sampling was used to select key informant from organisations that are involved in disaster management in the study area. At community level persons and institutions- formal and informal- involved in flood and drought management were identified with help of the ward councilor and the research assistant. Key representative of the institutions- chairperson or secretary depending on availability were selected for the interviews. Key community traditional leadership was also selected. At district level the chief executive of the rural district council

helped to identify institutions that are involved in flood and drought management in Kanyemba. District and rural district authorities and representative of the institutions involved in flood and drought management in Kanyemba were selected. At national level he staff from the Department of Civil protection was involved in identifying institutions involved in flood and drought management those which directly relate to Kanyemba were selected.

3.3.4 Data Analysis

(i) Thematic Approach

Thematic qualitative data analysis was employed to rigorously order and structures the qualitative data. Major themes identified on impacts of floods and drought included water supply, crop production and livestock. On the institutions structure the themes included formal and informal institutions and in terms of flood and drought management mechanism the main themes were early warning systems, mitigation, preparedness and response.

(ii) Descriptive Statistics

The statistical package for social sciences, (SPSS), was used to analyze quantitative data. The package enabled the generation of figures and tables of frequency tables and percentages on the extent of impacts of floods and drought in the study area.

(iii) Social Network Analysis

The institutional set-up and coordination framework was further used to analyze institutional networks that exist at community, district and national levels. Social network analysis software, UCINET – NetDraw was be used to identify, represent, analyze, visualize, or simulate institutions, agents, organizations, and inter-linkages

(iv) Conceptual Framework

A Conceptual Framework inspired by the Hyogo Framework for Action 2005-2015 (HFA) developed by the UN International Strategy for Disaster Reduction (UNISDR) was used to analyse the institutional framework for floods and drought management and their effectiveness in enhancing the resilience of Kanyemba community to floods and drought. The framework first defines the expected outcome and goals to be achieved and sets out the thematic areas which cover the main areas of disaster management. It then outlines indicators of community resilience

to disasters as results of appropriate institutional mechanisms that covers and integrates all the defined thematic areas.

The indicators of a resilient community outlined in the conceptual framework are customised from "Characteristics of a Disaster-Resilient Community framework" (Twigg 2009). It sets out the indicators of a disaster-resilient community in accordance with the five thematic headings - governance, risk assessment, knowledge and education, risk management and vulnerability reduction and disaster preparedness and response, - representing the main areas of disaster management, based on a the Hyogo Framework for Action. This scheme has been followed because is generally accepted by UN and other international agencies, most national governments and many non-governmental organisations (NGOs)

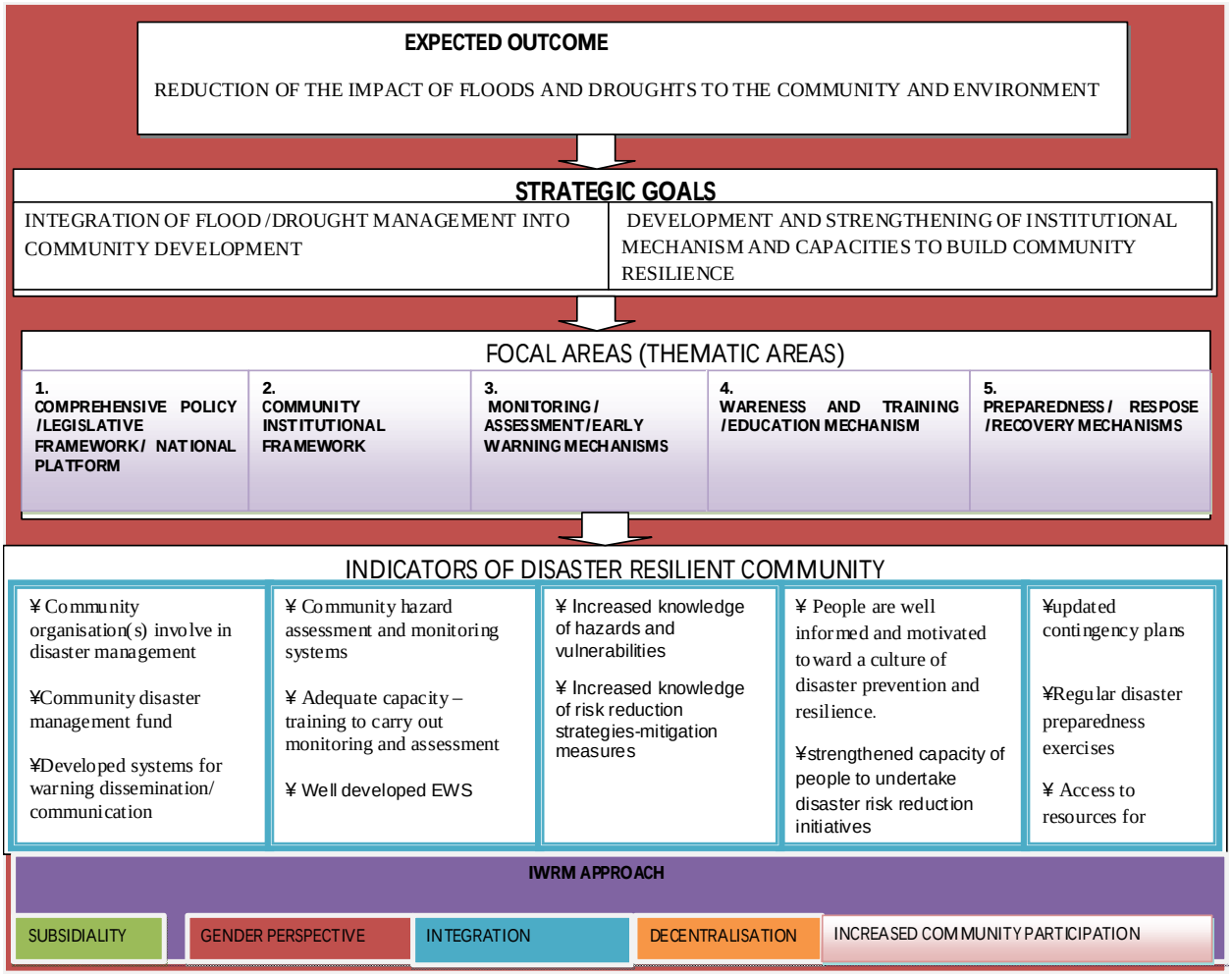

Figure 3. 2: Conceptual framework: Adapted from UNISDR and UNOCHA (2008)

(v) Milestones

A milestones model was also used as a simple weighting process to understanding progress (distance travelled' in some way) towards resilience in the community. The set of Characteristics of a Disaster-Resilient Community represents a goal: the highest level of resilience that is realistically attainable. A five-level scale is suggested, with each level marking a distinct stage in the development of resilience. It is designed to give a broad view of the state of resilience.

Table 3. 1: Milestones model

Level 1	**Little awareness of the issue(s) or motivation to address them. Actions limited to crisis response**.
Level 2	Awareness of the issue(s) and willingness to address them. Capacity to act (knowledge and skills, human, material and other resources) remains limited. Interventions tend to be one-off, piecemeal and short-term
Level 3	Development and implementation of solutions. Capacity to act is improved and substantial. Interventions are more numerous and long-term
Level 4	Coherence and integration. Interventions are extensive, covering all main aspects of the problem, and they are linked within a coherent long-term strategy
Level 5	A 'culture of safety' exists among all stakeholders, where DRR is embedded in all relevant policy, planning, practice, attitudes and behaviour

3.4 Limitations of the study

The researcher experienced some difficulties during the period of the study. I could not speak the local languages in the community which are Chikunda and Shona. I had to rely on the research assistant to translate the questions from English to Chikunda or Shona and the responses from Chikunda or Shona to English. They interviews could take longer than planned due to language problems.

3.5 Ethical issues

Permission was sought from the local authorities; District Administrator, Chief Executive of the Rural district Council, Chief of the community, and ward councilor to conduct research in the area. Informed concert was also sought the participants before participation in the study. Participants were also informed of informed about the objectives of the study and assured that individuals will not be identified by their names in the report.

CHAPTER 4

FINDINGS

4.1 Introduction

This chapter presents the findings of the study. It makes an analysis of the impacts of flood and drought and the institutional mechanisms that support community's resilience to floods and drought and also the effectiveness of the institutional mechanism in building the resilience of the community to floods and drought. The chapter is structured as follows: firstly findings on occurrence of floods and drought, their impacts on livelihoods in Kanyemba are presented. After that the existing institutional framework for floods and drought management is presented. Then the flood and drought management measures are presented.

4.2 Impacts of drought and floods on livelihoods in Kanyemba

4.2.1 Occurrence of droughts and floods in Kanyemba

Drought

Drought is a major feature of Zimbabwe's climate. Major drought occurred in Zimbabwe during the years 1911-12, 1915-16, 1921-22, 1923-24, 1946-47, 1967-68, 1972-73, 1981-82, 1982-83, 1986-87, 1991-92, 1994-95, 2000-01, and 2006-07. Most of these droughts were more severe in Natural Regions (NR) IV and V (FEWS NET, 2007; Russell, 2008). Zimbabwe is divided into five agro-ecological regions, known as natural regions on the basis of the rainfall regime. The rainfall declines from NR I through to NR V (Moyo, 2000). Kanyemba falls in NR IV and V. Annual rainfall in Kanyemba ranges from 450–650 mm. The area experiences severe dry spells occurring every rainy season, and frequent seasonal meteorological and agricultural droughts. Figure 4.1 shows the Natural Region in Zimbabwe.

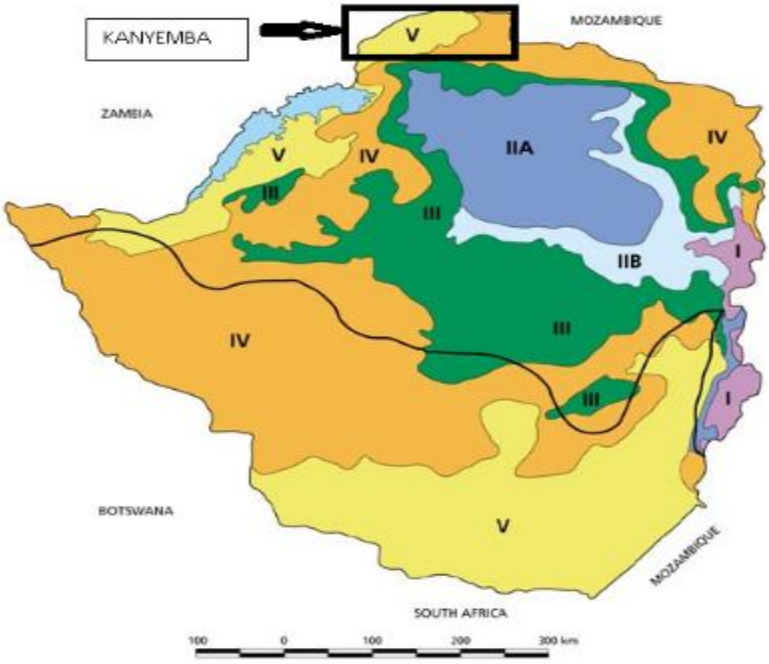

Figure 4. 1: Zimbabwe's agro-ecological zone: Source: FAO, 2006

The community in Kanyemba defines drought in terms deficiency of rainfall which causes crop failure and water shortage, drying up of rivers and boreholes. Drought in the area was said to occur in every 3- 5 years. Analysis of the rainfall data for the past two decades from Kanyemba meteorological station indicates that rainfall in the area is highly variable with many seasons experiencing rainfall 75% below expected rainfall average in the area. Five seasons in past two decades registered rainfall below the normal average rainfall of the area.

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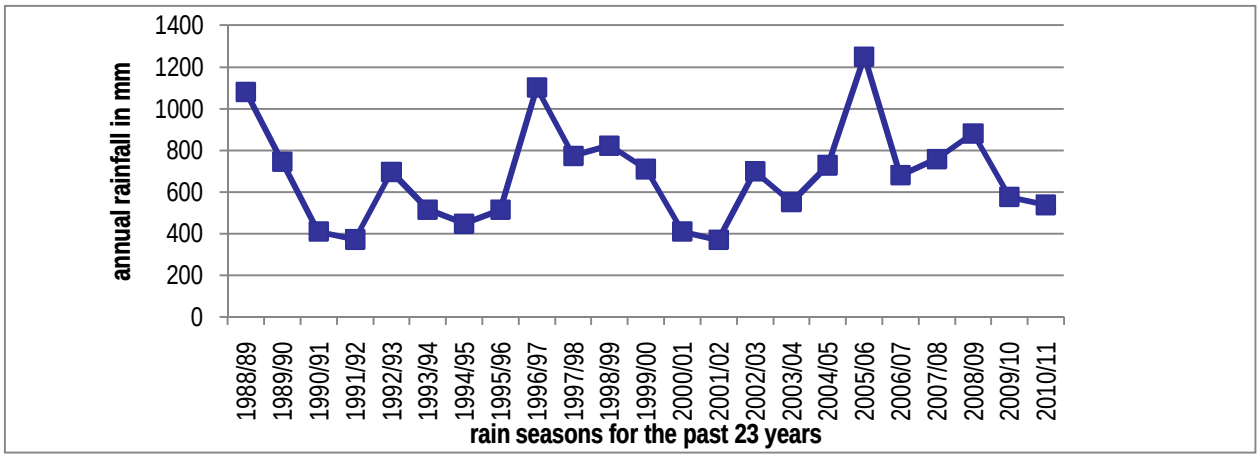

Figure 4. 2: Rainfall seasonal variability for the past two decades in Kanyemba

Further, annual rainfall may be normal that is about 500mm but the area experiences dry spells lasting two to three weeks. This have a devastating impact on crops, especially if they occur at critical crop growth stages such as the flowering or tasselling.. In the season 2010-11 when the study was conducted the area received normal rainfall (about 550mm), however, its distribution in the season was uneven. In February 2011 when maize was tasselling the rains stopped almost for the whole month leading to crop stress. Figure 4.3 shows rainfall distribution for the 2010-11 season.

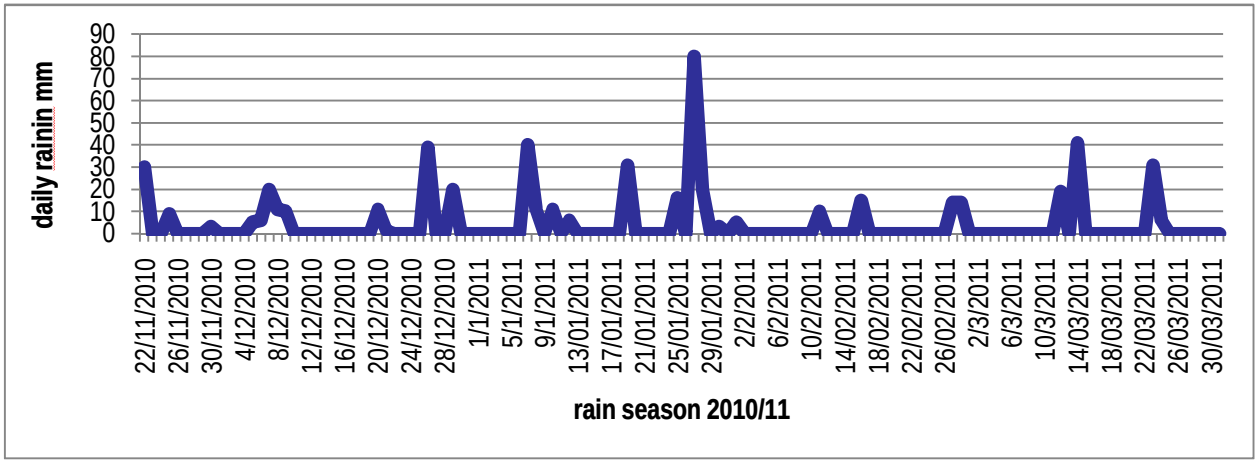

Figure 4. 3: Rainfall distribution for 2010/11 rain season in Kanyemba

Crop production in Kanyemba is rainfed. Dependence on rainfed agriculture leaves the community vulnerable.

Floods

Through interviews with household heads and local leadership the study found that the past decade has seen increased frequency of floods in Kanyemba which studies attribute to climate change. Table 4.1 shows the occurrence of floods in Kanyemba.

Table 4. 1: Frequency of floods in Kanyemba

Period	**Number of flood events**
1980 -1989	2 – (1982, 1989)
1990 - 1999	1 – (1997)
2000 - 2011	4 - (2000, 2003, 2006, 2010)

Madamombe (2006) suggests that floods in the area have increased as a result of increased frequency of occurrence of cyclones in the area. In February 2000 cyclone Eline hit the middle Zambezi basin bringing with it intense storms. In March 2003 the middle Zambezi basin was again affected by cyclone Japhet which also caused flooding in the area (Madamombe, 2006).

However, the occurrence of floods in Kanyemba is also induced by the operation of dams in the middle Zambezi River basin. Intense rains which are attributed to climate change in the Zambezi River basin upstream of the Kariba Dam lead to extremely high water levels in the Zambezi River and its tributaries, as well as the Kariba Dam. Opening of Kariba flood gates to discharge water from the reservoir, to contain the water level cause throw back in the tributaries to the Zambezi downstream of Kariba such as Mwanzamtanda River. In the past decade Kanyemba experienced flooding in the years 2000, 2003, and 2010 although the rainfall received in these years in Kanyemba was low. Key informant interviews with staff from Zimbabwe National Water Authority (ZINWA) and Manyame Catchment Council revealed that the floods of 2010 in Kanyemba were due to flow back from the Mwanzamtanda River. When high flows in the Mwanzamtanda River coincided with high flows in the Zambezi River- due to releases from Kariba Dam and the Kafue Dam, Mwanzamtanda River failed to discharge into the Zambezi causing flow back which lead into the flooding the area of chief Chapoto. Figure 4.4 shows the location of Kanyemba- Chief Chapoto area in relation to the Zambezi River and the dams.

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Figure 4. 4: Location of Kanyemba –chief Chapoto area in relation to Zambezi and Mwanzamtanda Rivers and the Dams: Source: AWF, 2008

4.2.2 Impacts of drought on livelihoods

Main impacts of droughts in Kanyemba as identified by the household heads through semi-structured household interviews include reduced crop yield, drying up of sources of water and livestock deaths. Figure 4.5 shows impact of drought on households in Kanyemba.

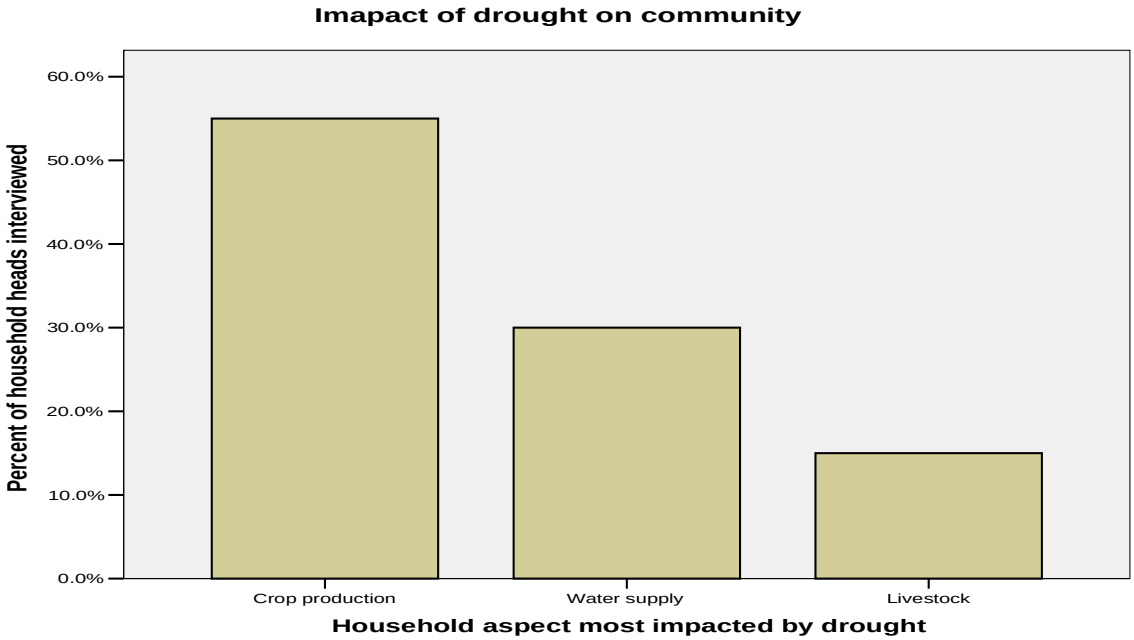

Figure 4. 5: Impacts of drought in Kanyemba as perceived by Household heads

In terms of crop production the study found that drought significantly reduces household crop production. Information gathered from 135 household heads who were interviewed indicate that

maize production at household level was significantly affected in 2001-02 season when there was a drought. Table 4.2 shows household maize production in Kanyemba.

Table 4. 2: Household maize crop production in Kanyemba

Season	Statistics	Household maize crop production (Kg)
Normal rain season	Mean	375
	Standard deviation	1.78
Drought season 2001/02	Mean	115
	Standard deviation	2.1

Low crop yields directly affect household income and food security. Most of the people rely on crop production for their livelihoods. Poor crop harvest due to droughts also reduces household income that they realize through crop sales and also causes food shortages.

Drought also affects livestock through shortage of pasture and water for drinking. Two of the household heads interviewed indicated that they lost their goats deaths due to shortage of pasture during drought in the 1991-92 seasons. 80 % percent of households heads interviewed indicated when there is a drought they are forced to sell their goats to earn some income to buy basic need such as maize in Zambia and Mozambique, which are the nearest markets. this leads to decrease in the goats owned by households as shown by the case study in the box 4.1 below

Box 4.1: Impact of drought on households in Kanyemba

Mrs. A is a 61 years old widow heading a household of 9, 3 children and 5 grandchildren. She does not have savings. She cannot afford to hire a tractor which cost about US$ 50. And without draught animals the household is forced to cultivate their land by hand, limiting the area they can plant. They have few skills having no contacts with the agriculture extension services. Her main source of livelihood is crop sale. She grows cotton, maize, sorghum, groundnut and cowpeas. In 2008 when there was a severe drought in the area she harvested only about 300kg of maize grain, 50 kg of sorghum, 50kg of cowpeas and groundnuts which she said was less than 30 percent of what she normally yield from the same piece of land in good crop seasons. She also harvested a few bales of cotton which did not help much due to inflation. The household was reduced to taking only two meals a day. This did not help much. She had to sell all her 7 goats which she was keeping for school fees for the children. Now she has no goats and she finds problems raising money to pay school fees her 2 grandchildren who are in primary school and are paying US$15 each. She is also complaining that before the drought she had a lot of chicken which were giving her eggs for relish but also help her when visitors come.

In terms of water supply the study found that drought negatively affect water availability in Kanyemba. All the villages in Kanyemba, except for Maliga village, use borehole as sources of water. However, due to prolonged hydrological droughts some boreholes in the area dry up. Table 4.3 shows the status of boreholes in Kanyemba.

Table 4. 3: Status of boreholes (Bh) in Kanyemba 2011

Non functional Bh	Functional Bh	Salty Bh	Bh dry in drought	Total Bh	% of Bh dry in drought
17	32	12	10	71	14%

When the boreholes dry up, women and girls have to travel long distance around 5km to the sources of water. Pressure on the few operational boreholes also increases (table 4.3).

Table 4. 4: Estimated distance to borehole and number of people per borehole in Kanyemba

Population	Functional Bh	Persons/ Bh	Average distance to Bh
4,459	**32**	139	2km

Some people resort to digging shallow wells on river beds (Figure 4.6). The study also found that wild animals also come to drink from the same shallow wells making the water not very safe and also leading to conflicts between people and wild animals.

> *"Sometimes when you go to draw water from the well on the river you find that wild animals are also coming to drink the water. The animals chase you. If they are not the dangerous animals we have to chase them" (Mrs. Botswana, March, 2011. Kanyemba).*

Figure 4. 6: Picture showing shallow well on the bed of Mwanzamtanda River

Impacts of drought on lives and livelihoods in Kanyemba community can thus be simplified as shown in the Figures 4.7 below.

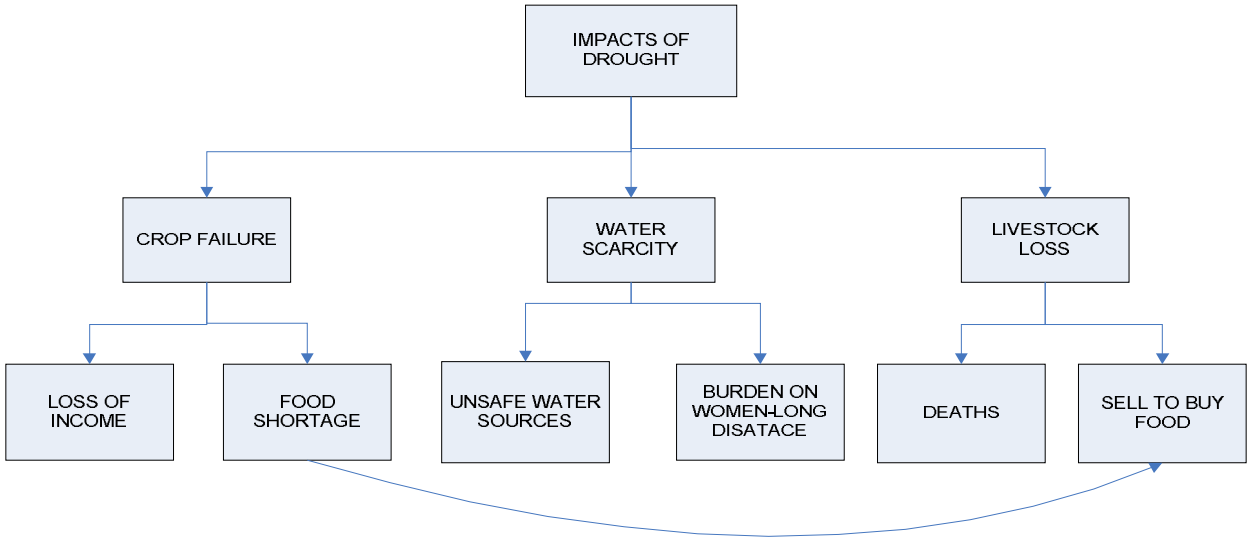

Figure 4. 7: Impacts of drought

4.2.3 Impacts of floods

Impacts of floods in Kanyemba as identified by the community can be categorized according to positive impacts that floods have on crop production as well as negative impacts that they have on crop production, livestock, lives, property and infrastructure and water supply.

Positive impacts of floods on the community

The study found that floods in Kanyemba have positive impact on crop production.

> *"For a long time now we have relied on Mwanzamtanda for 'dowe' - stream bank cultivation. Floods in Mwanzamtanda bring nutrients to the flood plain which enables us to practice dowe. We grow maize in the flood plain without applying any fertilizer or manure, and we harvest more than once in a year" (Name, February, 2011. Kanyemba).*

People in Kanyemba rely on floods to bring fertile alluvial soils on which they cultivate crops. They have small plots (area) on the flood plain. Semi-structured interviews with household heads indicated that 100 out of the135 households heads have small plots in the flood plain where they practice *dowe (*stream bank cultivation).

Negative impacts of floods on the community

The study found that major floods which occurred in the years 1982, 2000, 2003, 2007 and 2010 had negative impacts on the community. Memories in the community are still fresh of the flood which occurred early 2010. Houses in two villages on the flood plain, Chilamba and Maliga were washed away. Boats from Zambia came to rescue some people who were in trees. The other three villages which are in the upland; Chansatu, Chiluwe and Nyaruparu also lost their *dowe* which they cultivated in the flood plain. Livestock was also washed away. Some water sources such as wells in Maliga village were filled with sediments and some contaminated with debris. An irrigation scheme, Arizhboa irrigation scheme of 45 acres at the confluence of Mwanzamtanda and Zambezi rivers is affected by frequent floods that occur in the area. The irrigation canal and pipes are damaged and washed away by floods in the area. No irrigation is taking place because of the damaged pipes and canals.

Impacts of floods on lives and livelihoods in Kanyemba community can thus be simplified as shown in the Figures 4.8 below.

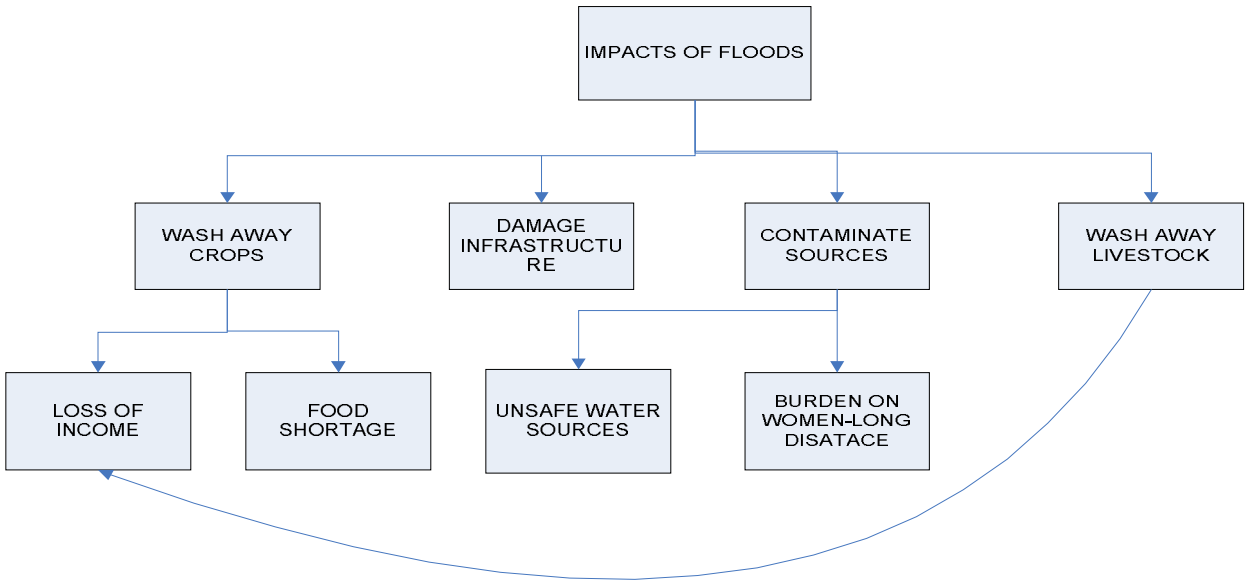

Figure 4. 8: Impacts of floods

4.3 Institutional Frameworks for floods and drought management in Zimbabwe

There is an institutionalized framework for the management of floods and drought in the country. The study found that the institutional framework that has been developed at the national and local level to support communities' response to the impacts of floods and droughts is comprised mainly of National Civil Protection Policy (draft), National Policy on Drought Management, Operational Manual for Management of Flood Emergencies in Zimbabwe, the Civil Protection Act of 1989 complemented by sectors legislations, Civil Protection Organisation and traditional institutions

4.3.1 Legislative Framework

National Civil Protection Policy

The National Civil Protection Policy is the main policy instrument that guides disaster management - including the management of floods and drought in Zimbabwe. The policy states that every citizen of Zimbabwe should assist where possible to avert or limit the effects of disasters.

The National Civil Protection Policy aims to ensure that disaster management measures are implemented promptly and comprehensively. The policy is divided into: a) a framework of the

structural model of the Zimbabwe's civil protection systems where the central government initiates disaster preparedness programmes through the relevant sector ministries with local administration taking the responsibility for implementing and maintaining its effectiveness; b) legislation for disaster management where the Civil Protection Act is defined and it main provisions spelt out; c) the National Civil Protection Plan where the frame of the planning levels for civil protection is defined; and d) the operational structure for Civil Protection Organisation.

National Policy on Drought Management

The National Policy on Drought Management aims to guarantee that relief assistance is provided to the communities affected in a manner which ensures that such efforts contribute towards rehabilitation and long term development and that drought mitigation activities get due attention in the government's development efforts. The policy delegates and delineates functions of institutions at national level, the National Drought Relief Committee down to district level the District Drought Relief Committee and Ward Development Committee at community level for implementing drought management activities. The policy also aims at harmony of relief effort and planned development to strengthen the economic fabric of the drought-prone areas to enhance the capability of the affected people to face the challenge of drought.

The policy is divided into: basic operational modalities in drought management; structure for relief management; duties and responsibilities of functionaries at different levels.

The Civil Protection Act

The Civil Protection Act of 1989 is the main piece of legislation that regulates disaster management including the management of floods and droughts in Zimbabwe. The Act is supported by sections of other relevant sector legislations such as the Police Act, Defence Act, Rural District Councils Act, Regional, Town and Country Planning Act, Public Health Act, Environmental Act and Water Act.

The main components of the Civil Protection Act include establishing the national platform for disaster management, which is called the Civil Protection Organisation and the Department of

Civil Protection as the nodal authority for coordination of the Civil Protection Organisation. The Act also defines the composition and functions of the Civil Protection Organisation. Department of Civil Protection is in the Ministry of Local Government Public Work and Urban Development (MLGPWUD). The CPO is decentralised by the act to provincial as well as district levels. The Act also defines the planning level from local community in the Civil Protection Organisation; and procedures for the declaration of the State of Disaster by His Excellency, the President of the Republic of Zimbabwe; and establishing a fund to finance civil protection.

4.3.2 Gaps in the legislative framework

Analysis of the legislative framework described above reveals some limitations, gaps and issues which hinder effective management of floods and drought.

Firstly, the legislative framework particularly National Civil Protection Policy and Civil Protection Act centres mainly on the establishment of national floods and drought management organizations, with narrow focus on flood response rather than a comprehensive flood risk reduction. It places little emphasis on mitigation measures for example the construction of structures which can protect the area from floods caused by throw backs. Further, no linkages between mitigation, preparedness, response and recovery are made in the legislation.

Secondly, there is no clear provision for effective funding mechanisms for DCP and the whole CPO structures at provincial, district and community levels. According to staff member of the DCP, the DCP only manages to get sufficient funding when the State President declares a state of national disaster.

Thirdly, the legislative framework does not provide for effective enforcement mechanisms for sectoral disaster planning and response. It also does not provide for the benchmarks and mechanism for monitoring and evaluation of floods and drought management activities in the community.

Further, there is no clear arrangement in the legislative framework to strengthen the capacity of local community structures to effectively manage disasters. No emphasis is made in the

legislation to ensure that the relevant actors in floods and drought management at lower level, district and also community levels receive appropriate training on regular basis to effectively carry out their mandates.

In addition, legislation for floods and drought management does not explicitly focus on the need to strengthen traditional flood and drought management mechanisms, and do not emphasize preservation of the local and traditional knowledge and experience that underlie the mechanisms employed by the community to survive floods and drought in the past. The links between legislative framework, institutional structures and the local traditional flood and drought management mechanism are weak as represented by Figure 4.10 below.

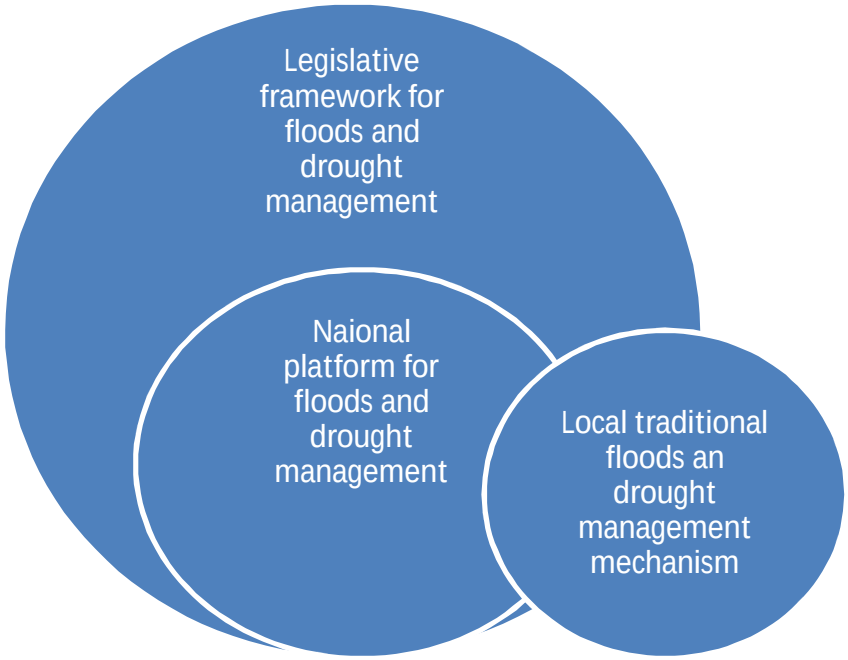

Figure 4. 9: Representation floods and drought management framework

While the legislative framework clearly embodies the formal national platforms involved in the management of floods and droughts the local traditional mechanisms for floods and drought management however are not adequately embodied and supported by legislative framework.

Finally, gender has been pointed out as a fundamental element of disaster management (Ariyabandu and Wickremasinghe, 2004). Although women and men have common concerns disaster does affect men and women differently due to their socially assigned different roles and responsibilities and resulting vulnerabilities and capacities. In the legislation however gender

issues in general are not addressed such as ensuring equal participation of men and women in governance of floods and drought management that is in policy making, planning, coordination of disaster preparedness, response and recovery through capacity building and training; to build community resilience to floods and drought

The legislative framework however clearly defines institutional architecture and its composition at all levels- national, provincial, district and community, and clearly specifies the role of key actors and organisations involved in the management of floods and drought. In addition it clearly establishes decentralised structures for flood and drought management to community levels. The legislation also emphasize on community participation in the management of floods and drought by involving the community members in the community structures.

4.3.3 National Platforms for floods and drought management

National floods and drought management organizations

In Zimbabwe platforms for management of floods and drought are located in line ministries – Ministry of Local Government Public Works and Urban Development (MLGPWUD) for floods and Ministry of Public Service Labour and Social Welfare (MPSLSW) for drought- not in Office of the President / Prime Minister's Office. Figure 4.11 shows the model of institutional set up for floods and drought management

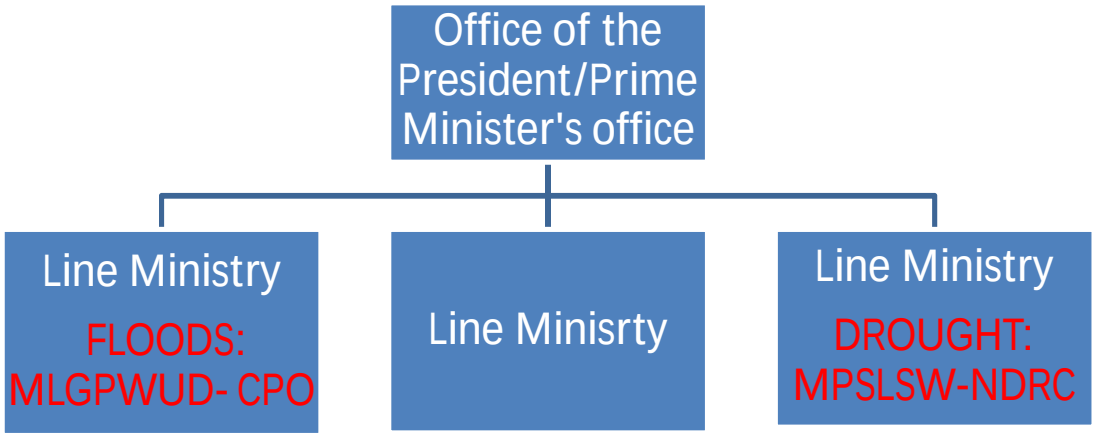

Figure 4. 10: Model of Institutional set-up for flood and drought management in Zimbabwe

Constraints of the model of the institutional set up

The location of the floods and drought management coordinating structures in the line ministries has impacts on effective coordination and management of floods and drought. The minister's chairing the flood and drought platforms do not have greater authority and support as it would be if the structures were located and chaired by the office the President or Prime minister.

One DCP member said that:

> *"Some ministries who are members of the National Civil Protection Committee do not come to participate in the committees meeting and prepare the sector plans as required. We have no overarching power to compel them as we are at the same level. We also have problems when it comes to funding and resources. When we go to the Ministry of Finance for finances to implement measures to mitigate floods such as public awareness and training on rescue and safety and flood risk assessments the response is that there are no floods yet"((Miss. Congo, February Harare)*

In the line ministries, MLGPWUD and MPSLSW, it is difficult to guarantee the representation and participation of the other line ministries and get the overarching support needed for flood and drought management, disaster management, due to political reasons.

Floods management platform

There is a permanent institutional structure for implementation of flood management activities in Zimbabwe, the Civil Protection Organisation (CPO), established by the Civil Protection Act of 1989. As per the Act, the Civil Protection Organisation is chaired and anchored by the Department of Civil Protection (DCP) in the Ministry of Local Government Public Works and Urban Development (MLGPWUD). The CPO includes National Civil Protection and Planning Committee (NCPPC) chaired by the Department of Civil Protection; Provincial Civil Protection and Planning Committee (PCPPC) chaired by the Provincial Administrator (PA); and District Civil Protection and Planning Committee (DCPPC) chaired by the District Administrator (DA) which encompasses the Ward Development Committee (WDC) chaired by the ward councilor, WDC is responsible for flood management at community level. The local community structure

for floods management, WDC in Kanyemba falls under Mbire District Civil Protection and Planning Committee which is under Mashonaland Central Civil Protection and Planning Committee. Table 4.5 shows the Civil Protection Organisation structures for floods management.

Table 4. 5: Flood management structure: the Civil Protection Organisation

Level	Structure	Coordinator	Functions
NATIONAL	National Civil Protection and Planning Committee (NCPPC)	Ministry of Local Government Public Works and Urban Development (MLGPWU): Department of Civil Protection (DCP)	-Execution of flood management activities -Resource mobilisation; national and international appeals -Flood monitoring and early warning -Flood risk assessment -Flood risk information dissemination and public awareness -Issue policy directions to counter the threat of floods -Undertake contingency planning for flood emergency -Provide guidelines for flood management to the Provincial Civil Protection and Planning Committee. -Recommend the declaration of flood as a disaster
PROVINCE	Mashonaland Central-Provincial Civil Protection and Planning Committee (PCPPC) Report to NCPPC	Provincial Administrator (PA)	- Execution of flood management activities in the province -Information dissemination and public awareness -Undertake contingency planning for flood emergency in the province -Provide guidelines for flood management to the District Civil Protection and Planning Committee.
DISTRICT	Mbire- District Civil Protection and Planning Committee (DCPPC) Report to PCPPC	District Administrator (DA)	-Execution of flood management activities in the district -Information dissemination and public awareness -Undertake contingency planning for flood emergency in the district Conduct rapid need assessment during flood emergency
	Kanyemba-Ward Development (WDRC) Report to DCPPC	Ward Councilor (WC)	-Information dissemination and awareness at community, household and individual levels -Conduct rapid need assessment during flood emergency -Assist in identifying flood relief needy households -Involved in distribution of relief items
	24-Village Development Committees (VDC) Report to WDC	Village Head (VH)	-Information dissemination and awareness at household and individual levels -Conduct rapid need assessment during flood emergency -Assist in identifying flood relief needy households -Involved in distribution of relief items

Drought management platform

Drought management normally comes under national Drought Relief Committee (NDRC) chaired by the Ministry of Public Service Labour and Social Welfare (MPSLSW). However, when a drought is so severe that it is declared a disaster as in 1991-92 its management falls under

the CPO to ensure that drought relief measures are implemented promptly and comprehensively (NEPC, 1999). The National Drought Relief Committee comprise: Inter-Ministerial Committee of Officials chaired by the MPSLSW; Provincial Drought Relief Committee (PDRC) chaired by the Provincial Administrator (PA); and District Drought Relief Committee (DDRC) chaired by the District Administrator (DA) which encompasses the Ward Development Committee for drought management at community level. Table 4.6 shows the national platform for Civil for drought management.

Table 4. 6: Drought management structure: the National Drought Relief structure

Level	Structure	Chair	Functions
NATIONAL	National Drought Relief Committee (NDRC)	Ministry of public service labour and social welfare (MPSLSW) Social Welfare	-Initiate the implementation of all drought relief activities -Review the status of rainfall, agricultural operations in the country and crop prospects and assess the food security situation -Issue policy directions to counter the threat of drought and to undertake relief measures and prescribe guidelines for assistance and allocation of resources for relief effort -Appraise the likely onset of drought conditions and authorize appropriate measures to be taken - recommend the declaration of drought as a disaster
PROVINCE	Mashonaland Central-Provincial Drought Relief Committee (PDRC) Report to NDRC	Provincial Administrator (PA)	-Review status of rainfall agricultural operations, crop prospects, and livestock condition in the province -Appraise the likely on-set of disaster conditions in the province Monitor the execution of relief measures in the provinces - Issue detailed work guidelines for drought management to the district -Formulate provincial drought management plan
DISTRICT	Mbire- District Drought Relief Committee Report to PDRC	District Administrator (DA)	-Review status of rainfall agricultural operations, crop prospects, and livestock condition in the district -Appraise the likely on-set of disaster conditions in the district -Issue detailed work guidelines for drought management and sustainable development -Monitor the execution of relief measures in the district -Appraise the likely on-set of disaster conditions in the districts
	Kanyemba-Ward Development (WDRC) Report to DCPPC	Ward Councilor (WC)	-Coordinate drought management and sustainable livelihood activities at the community, household and individual levels -Facilitate community participation in development and -Assist in identifying drought relief needy households -Involved in distribution of relief items
	24-Village Development Committees (VDC)	Village Head (VH)	-Encourage community participation in development -Assist in identifying drought relief needy households' areas and involved in distribution of relief items

Analysis of the gaps in the institutional structures for the management of floods and drought

The Civil Protection Organization framework and can be presented graphically as shown in Figure 4.12 below. The platform for drought management has same structures with floods management structures at provincial, district and community levels

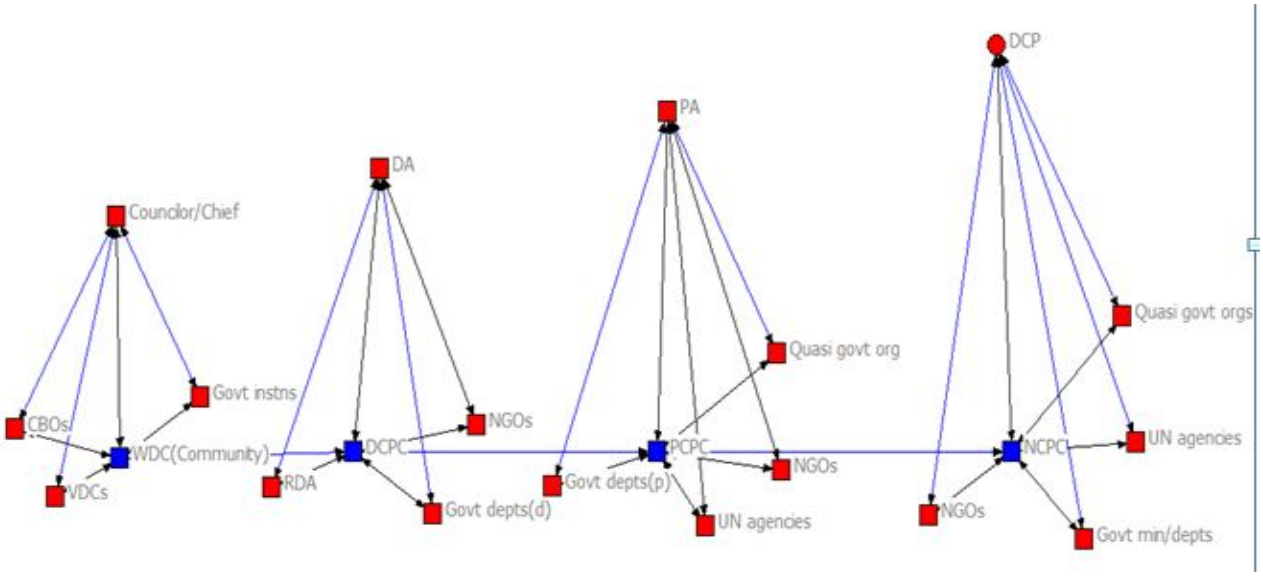

Figure 4. 11: Socio-gram of the Civil Protection Organisation, blue boxes represent the structures at national, provincial, district, and community levels, red boxes represent composition of the structures with the coordinator on top

From the socio-gram some distinct features in the architecture of the platforms for floods and drought management can be identified. Firstly, the platform for floods and drought management are decentralised to community level. There are institutionalized structures for floods and drought management at national, provincial, district and community levels which is important for encouraging community participation in the management of foods and drought. Secondly, the platforms are multi-stakeholder setup that is the structures draw involvement of various government ministries / departments and administrative bodies, the civil society and United Nations agencies. Lastly, through the involvement of various development-related sectors in the flood and drought management the platforms thus facilitate mainstreaming of disaster management.

The study however further revealed through in-depth interviews with key informants at district level as well as national level, that the Civil Protection Organisation and the National Drought

Relief Committee have some challenges. Firstly, there are some gaps in the structures at lower district and community levels. There is lack of representation of key institution such as the DCP at lower levels of the Civil Protection Organisation. Secondly the institutional linkages between various actors involved in flood and drought management within the district structures and also vertical linkage between the community and district structures to the provincial and national structures is weak due to inadequate communication systems at community and district levels.

The Department of Civil Protection as an established office for disaster management with all the resources for disaster management- trained personnel, vehicles, funds, communication equipment (phones, fax, and internet) is found only at national level (NCPPC-DCP) located in Harare. DCPPC in Mbire chaired by the DA's office located at Mushumbi Pools there is no office of the DCP. Coordination for floods management at DCPPC level is done by the DA which has no specialist training in disaster management and is occupied with other administrative issues.

Secondly, the offices the chair of the WDC in Kanyemba and chair DCPPC, the DA in Mbire at Mushumbi Pools have no phone, fax, or internet to quickly link with other actors in the district and also higher structures. They rely only on police radio which is not reliable as it is not in good condition and also dependent on weather. Lack of representation of key institutions and poor communication systems at lower levels affect effective horizontal and vertical coordination for effective and timely management and response to disasters such as floods which are rapid onset disasters.

> *"When floods occurred in Kanyemba in 2010 the district administrator who is the chair and coordinator of the DCPPC and the chief executive officer for the rural district council were not around. They were attending to other issues. They had gone for a meeting in Bindura. It was difficult to link and mobilize other actors such as Lower Guruve Development Association (LGDA) and Word Vision Zimbabwe (WVZ) and also link to the provincial and national civil protection authorities" the radio system was not working properly. (Mr. Kenya, DCPPC member: March, 2011. Mushumbi Pools, Mbire)*

4.3.4 Institutionalized local structures for floods and drought management.

At district level, in Mbire, structures for flood and drought management as shown in Tables 4.5 and 4.6 falls under the overall coordination of District Administrator, who is the chair for the DCPPC and DDRC. The members for drought and flood management structures in Mbire district are the same: Zimbabwe Republic Police (ZRP), Agriculture and Extension Services (Agritex), Veterinary Services (Vet), Social Welfare, Tsetse Control, National Parks and Wildlife Department (NPWD), Lower Guruve Development Association (LGDA), and World Vision Zimbabwe (WVZ), office of Rural District Council (RDC) which encompasses the Kanyemba Ward Development Committee. ZRP together with DA chair the District Civil Protection and Planning Committee. Agritex and Social Welfare co-chair the District Drought Relief Committee. The Ward Development Committee is chaired by the ward councilor and other members include the Communal Area Management Program for Indigenous Resources (CAMFIRE), Zimbabwe Red Cross Community Based Volunteer Team, Village Development Committee, and heads of government institutions in the community-school, clinic, and police. The local structures for floods and drought management in Mbire Distinct can be diagrammatically represented as follows.

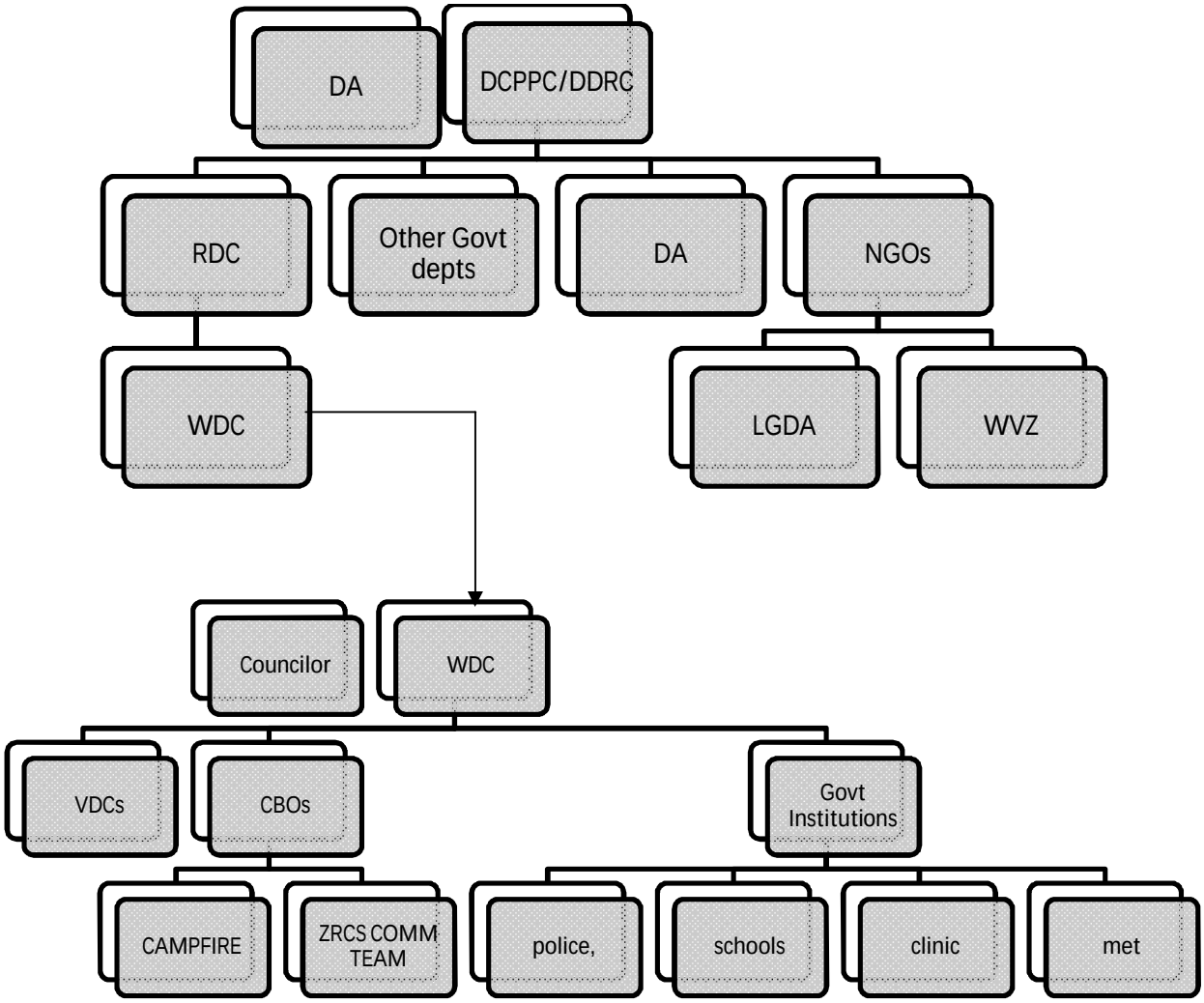

Figure 4. 12: Framework for institutions for flood and drought management

Capacity of the institutionalized local structures for the management of floods and drought

Although there are well laid decentralized organizational structures, Mbire DCPPC and DDRC and the Kanyemba WDC for the management of floods and drought at community level in Kanyemba as shown by the framework in Figure 4.10, the devolution of competencies and resources for floods and drought management to these local structures is limited. The study revealed that the DCPPC and DDRC and the WDC and VDC are incapacitated in terms of training, financial and materials resources. The DCPPC, housed in the DA's office at Mushumbi Pools about 100km from Kanyemba community, have no funds and also material resources such vehicles allocated for floods mitigation activities such as conducting regular flood risk

assessments, educating the community about flood risks, safety measures, and preparedness exercises. The DDRC lack the means for the Agritex officer to regularly visit the farmers in Kanyemba to sensitise and train them on best agricultural practices to mitigate and prepare for drought condition thus building the community's resilience to drought. The DCPPC and DDRC also lack financial and material to mobile the various actors as shown in the framework to plan and update the contingency plans to prepare for floods and drought events at district level. Floods and drought risk reduction activities by the DCPPC and DDRC often depends on the presence and support of non- governmental organisations.

One DCPPC member said that

> "*There are no vehicles, funds to buy fuel, pay for the necessities allocated to the district for management of floods and droughts risk reduction activities. Although we are aware of the need to regularly sensitise communities and update the contingency plans to prepare for coming disasters, we lack the means such as vehicles to reach the community in Kanyemba and socialize them of the flood and drought risk. Non-governmental such as LGDA, World Vision, Christian Care are the one who educate and encourage farmers to practice in drought tolerant agriculture in the community.*" *(Mr. Kenya, DCPPC member: March, 2011. Mushumbi Pools, Mbire)*

The community structure, Ward Development Committee, lacks the technical knowledge and material resources for disaster management. The community structures received no training on how to: conduct floods and drought risks assessment; develop floods and drought contingency plans to prepare for floods and drought; to rescue and help people evacuate in case of floods. Interviews with staff from at district structures for flood and drought management, the DCPPC and DDRC as well as national structures, the DCP pointed out that factors that hinder training of community structures in management of disasters is mainly resources, both financial and material resources. It was pointed out that funds are only given to the DCP when a disaster is declared to immediately respond to the disaster. The community organizations also lack the material resources to quickly disseminate emergency information to the people in the community such as sirens, bicycle. Further the community structures have no flood emergency facilities such

as reliable communication equipments to link with the DCPPC and boats to use in times of floods. This makes them helpless in the event of a flood and has to only wait for the rescue teams from Harare to come.

> *"When floods occurred in March 2010 we were helpless and unable to rescue the people of Chilamba and Malaga villages who were stranded in trees. We have no boat and, life jackets. We could not manage to call the DA in Mbire because radio communication was poor. Thanks to our Zambian neighbors who provided the boat that rescued the people, who were stranded in tree. For the DCP in Harare to know that we are flooded was because we called chief Chapoto- the chief of this community-who happened to be in Harare by then. We had to call through the Zambian Mobile phone network which is accessible here in Kanyemba. The chief then managed to go to the DCP offices to inform them about the disaster.," (Mr. Bush, WDC member: Interview, early February, 2011, Kanyemba)..*

However, the study also revealed some strengths and opportunities which if well exploited can help to enhance floods and drought management in Kanyemba. Firstly, there is willingness of the part of the community members to manage floods and drought in the community. There are young people who are working as volunteers groups- LGDA and Red Cross community volunteers- in the WDC. From each from village the community members have elected seven members to form Village committees for management of floods and drought. The secretary and the chair of the committees who is the village head also participate in the WDC. The WDC participation is thus a good representation of the community. Secondly, WDC conduct meeting every three months to discuss development issues in the community. Community based management of wild forest and a wildlife resource in Kanyemba is one of the success stories in Zimbabwe. Finally, the community actors in the WDC also have good knowledge of the area and experience of floods and drought in the area.

Informal institutions and the Indigenous knowledge systems for flood and drought management

Management of floods and drought in Kanyemba also involve the traditional institutions. These include: traditional institutions -chief of the community and his elders, the village heads, and their elders, who over the years have employed indigenous knowledge to monitor and predict floods and drought and also used traditional measures to mitigate the impacts of floods and drought. Some of the indicators for monitoring floods and drought which were found during field work through interviews with traditional leadership and elders in community are shown in the Table 4.8 below.

Table 4. 7: Traditional indicators of drought and floods: Source: traditional leadership and community elders)

Disaster type	Traditional indicators
Drought *(njala*)	Signs of droughts conditions -a lot of wild fruits (masawu, nungula, suvu, siga, Chenje, matufu, mawuyu, swanza) -baboons (koro), come to the villages to catch goats, chicken -spider (dvatsvatsva), keep its hole/house open in wet season
Floods *(Mafashamu)*	Signs of floods -birds relocating their net from river banks -birds(zikononongo/sekere/ shuramurowe) fly from the river in large flock

The fishermen in the community have also developed indigenous knowledge to monitor water levels and the way it flows in Zambezi and Mwanzamtanda to see if the flood gates at Kariba Dam are opened. If the water on the banks show some foam, it means that the level of the water would be rising, and a possible indication that the flood gates would have been opened.

Elders in the community report the indicators of floods and drought conditions to the chief of the community through the village heads. The chief through the village structures which include the

village heads and village committee alert the community members about the floods and drought forecast. In case of flood forecast the community members are informed to remove their animals from the river banks and in case of drought the community members are encouraged to grow drought resistant crops such as sorghum to mitigate impacts of drought on food security by households. The study however found that the indigenous knowledge system for monitoring and predicting floods and drought is in danger of being lost. The people with knowledge are passing away together with the knowledge as the knowledge is are not yet documented and they are a few people in the community who know about the flood and drought indicators. Secondly, the traditional floods and drought monitoring and warning systems (IKS) in Kanyemba are not synchronized into the scientific early warning systems and given the critical attention that they require.

4.4 Floods and drought management measures

Flood and drought management by the CPO and NDRC involves an integrated process of planning, organising, coordinating and implementing measures required for mitigating the risk through early warning and increasing the preparedness levels, and response actions.

4.4.1 Monitoring and early warning

Monitoring and early warning for floods is done by NCPPC through National Climate Outlook Forecast (NACOF) which is chaired by Meteorological Service. Other members include Zimbabwe National Water Authority ZINWA and Zambezi River Authority (ZRA). The National Climate Outlook Forecast in collaboration with the Southern African Regional Climate Outlook Forecast (SARCOF) monitor weather and climatic parameters and hydrological conditions. NACOF issue seasonal rainfall forecast and associated flood risks in August or September and mid-seasonal forecast for October to December, and January to March. Through the CPO the warnings are disseminated to the community. Figure 4.14 shows the flood early warning and dissemination system.

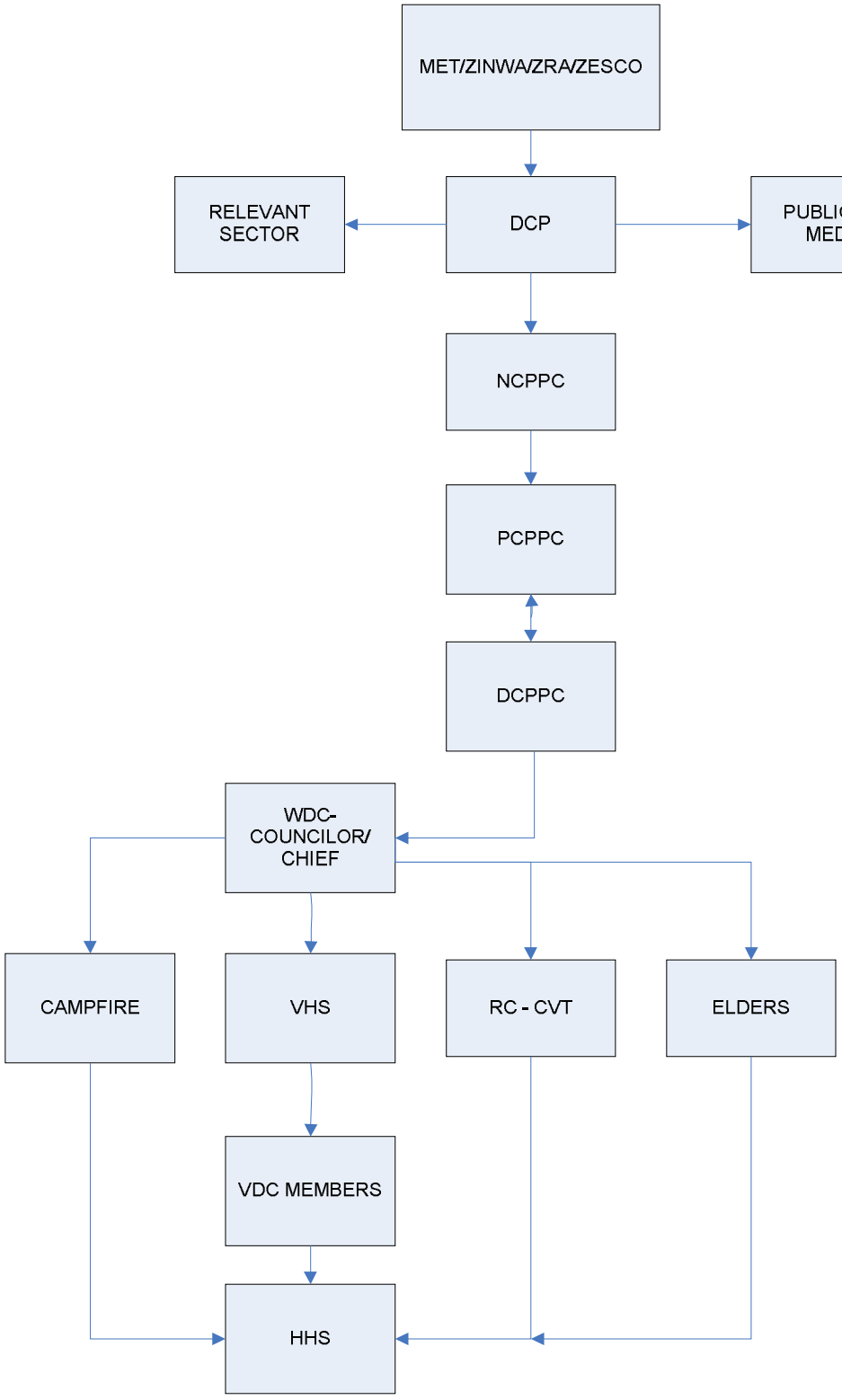

Figure 4. 13: Diagrammatic representation of the early warning and dissemination system

Monitoring and early warning for drought is done by National Early Warning Unit (NEWU) chaired by the Ministry of Agriculture through Agritex. Agritex, and Meteorological Services in collaboration Regional Drought Early Warning Unit, SADCC Food Security Unit, Co-ordinate collection of information and data pertaining to weather, crops, food and nutrition status, marketing trends in commodity prices, livestock condition, availability of water and pasture. Agritex through its offices at district and ward levels and the Meteorological Services through its meteorological stations collect the information which is sent to the NEWU. The National Early Warning unit reports periodically the integrated information about occurrence of drought conditions, and scale of impact to the NDMC through Ministry of Agriculture. Drought conditions are forecasted and warnings are issued through the NDRC structures down to the community.

The study found that there is only one Meteorological Service station in Kanyemba to cover an area of about more than 500km^2. Most rivers in the sub-catchment including Mwanzamtanda along which the community is settled are not gauged. The gauging stations at Angwa and Manyame Rivers which are flowing into Cahora Bassa are not working. Poor network of observatories make is difficult to get real time meteorological and hydrological data which is representative of the sub-catchment. Interviews with staff from ZINWA, and Manyame Catchment Council indicated that due to lack of real time data, forecasting of floods in Kanyemba is difficult and no forecast was made for the floods which in Kanyemba early 2010.

Secondly, the channels for information flows to the local community in Mbire district are relatively poor. Seasonal and weakly forecast by the Meteorological Services are disseminated through newspapers, radios and bulletins. There is no newspaper, telephone, or radio coverage in Mbire. Warning are disseminated after sometime through bulletin-booklet which have to be delivered to DCP, then PCPPC where they are to be carried to the DCPPC and then to the community.

One member of the DCPPC said that

> *"Due to poor communication systems in the Mbire, forecast may be released on the radio or in news papers that it will not rain for the next two weeks in this area, there are no radio or newspapers in Kanyemba and without knowing farmers plant, or apply*

fertilizer. Little resources that they have are thus wasted". (Mr. Cameroon, DCPPC member: March, 2011, Mushumbi)

Drought early warning is delivered to the community through Agritex office. However is no Agritex officer resident in Kanyemba to monitor crop and livestock situation. The officer has to come from Mushumbi Pools which is difficult due to long distance, poor roads and lack of vehicles.

4.4.2 Awareness, preparedness, education and mitigation measures

Depending on availability of funds and appropriate resources which most of the time depend on the donor or nongovernmental organization support, the NCPPC's public awareness team conduct flood risk awareness campaigns in flood prone areas after issuance of the flood forecast. In Kanyemba the study found that only once did the awareness campaign team come to the area to raise awareness on flood risks.

"It was only at the beginning of this season that we first saw a team from the NCPPC coming to Kanyemba to sensitise us on flood risks". (Mr. Russia, WDC member: February, 2011, Kanyemba).

Agritex is involved in alerting farmers to take contingency measures when dry spells are anticipated. Farmers are encouraged to practice water conservation farming techniques-zero tillage, plant drought resistant crops- sorghum and millet and short season maize verities. However the study found that the Agritex officer do not frequently visit the farmers in Kanyemba. Interviews with household heads indicated that that they see Agritex office once in a season and many times not at all.

Traditional practices for mitigating impacts of floods and droughts

The study found that many people in Kanyemba mostly rely on dowe for mitigating the impact of drought on crop production which is the main livelihood in the area. Over 30 per cent of the population in Kanyemba own small plots in the flood plain where they grow maize twice in a year. However, dowe is no longer adequate as it is prone to floods which have increased in the

Kanyemba in recent years. No agriculture extension services are given to farmers on how they can improve dowe cultivation in order to maximise yields.

4.4.3 Response to floods

In case of a flood event, the normal response mechanisms is that the community through the chair of the Ward Development Committee sends report to the DCPPC which then send the Report to the NCPPC through the PCPPC (figure 4.10). The NCPPC through DCP activates the multi-sectoral CPO. Evacuation and rescue team comprising ZPR Sub-aqua department, Civil Aviation, Zimbabwe Red Cross from the NCPPC is immediately sent to the affected area. Rapid needs assessment is conducted and relief items distributed to the affected households.

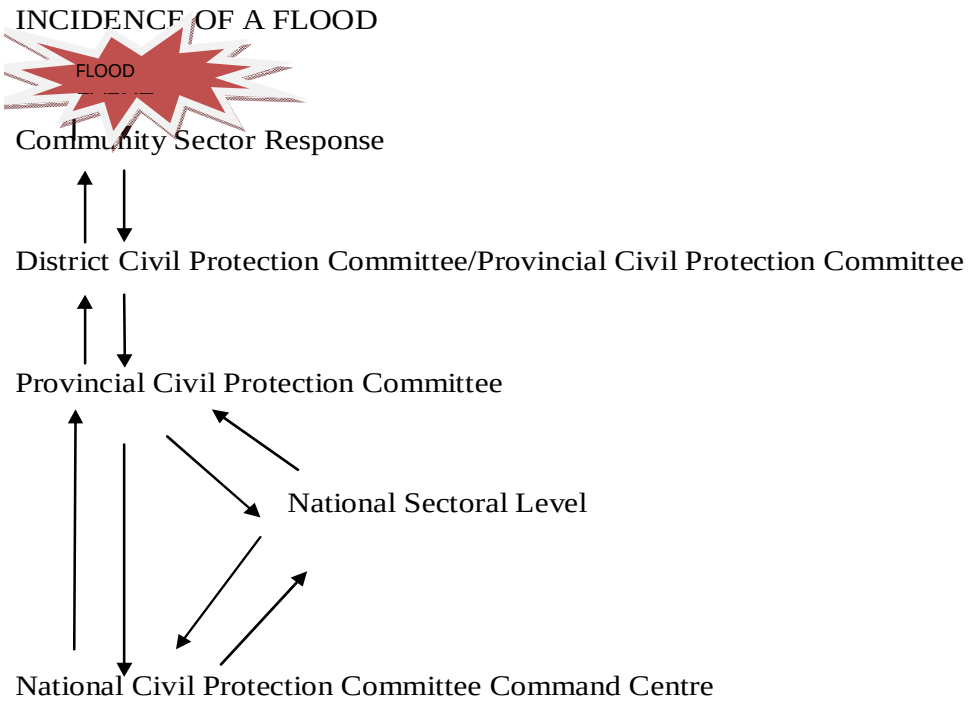

Figure 4. 14: Flood response mechanisms: Source: Operational manual: DCP

In Kanyemba and Mbire district as whole the study found that, with reference to the floods that occurred in early March 2010, poor communication hampers coordinated and timely response to flood emergency. The communication problem is further compounded by the bureaucratic nature of the information flow system as shown in figure 4.15 and the centralization of resources at the

national level while the local community where disaster take place there are no resources. Financial, material and technical resources i.e. vehicles, evacuation team, relief items, and finances are controlled at a national level by the DCP who are to commandeer them to the affected In case of a flood event, the community through the chair of the Ward Development Committee sends report to the DCPPC which then send the

4.5 Characteristics of a disaster resilient community

It is helpful to consider a model of 'indicators of a resilient community' by Twigg (2009). The model is useful in considering the effectiveness of the Kanyemba community to respond to droughts or floods. The model has been modified based on the conceptual framework that is suitable within the context of this study. The model maps the thematic areas of disaster management the Hyogo Framework for Action and sets out the characteristics of a resilient community which are linked to the effectiveness of institutional mechanisms. The situation in Kanyemba is assessed against the model as shown below. This model has been used and it is generally accepted by the UN and other international agencies as well as most national governments and many non-governmental organisations.

Table 4. 8: Characteristics of a disaster resilient community

Thematic Area	Characteristic of Resilient Community /Indicators of Community Resilience	Situation in Kanyemba
Governance	Representative community organisation dedicated to disaster management	X
	Community disaster management activities are supported by the policy and legislation	
	Community organisations have the capacity in terms of training, material and financial resources to implement disaster management activities	
	Improved traditional institutions and knowledge system straining- to enhance the role of traditional authorities	
Monitoring, Risk assessment, Knowledge and Education	Skills and capacity to carry out community hazard and risk assessments maintained through support and training.	
	Strengthened early warning systems and Improved information dissemination and communication	
	Awareness of community early warning systems	
	Community knowledge of hazard, vulnerabilities, risk	X
	Possession of appropriate technical and organisational knowledge	
Risk management/ Vulnerability reduction	Flood and drought resistant /safe and diverse livelihoods	X
Disaster preparedness and Response	Emergency facilities (communication equipment, shelters, control centre etc) available and managed by community members, diversity of communication infrastructure	
	Regular training provided for local organisation, regular practice drills, scenario exercises	
	Community organisations has the capacity to respond to the hazard event	

X indicate that the indicator that is available and well addressed

The model, through discussion with the community shows some weaknesses in the resilience of Kanyemba community to floods and drought. Although there are structures, Ward Development Committee, and Village Development Committee in place for the management of floods and drought their capacity to effectively manage floods and drought remains low. The Ward Development Committee and the Village Development Committee lack the training and skills, material and

financial resources for effective management of floods and droughts. The early warning systems are not strengthened. Livelihoods are limited and vulnerable to drought or floods

Summary

The findings presented in this chapter have revealed a number of issues with regard to the effectiveness of the instructional mechanisms in supporting floods and drought management in Kanyemba. The local institutional structures in Kanyemba lack the capacity: material, finances, and appropriate training and skills to undertake floods and drought management activities. In Kanyemba, flood and drought early warning systems are not strengthened. There are no adequate mechanisms for monitoring meteorological and hydrological conditions to accurately forecast floods and droughts. In addition Kanyemba community has difficulties in accessing floods and drought early warning information on time due to the absence of reliable communication systems. Furthermore, the indigenous knowledge systems for management of floods and drought are not adequately supported. The traditional flood and drought indicators are not documented synchronized with the national early warning systems. No agriculture extension services are given for *dowe* cultivation yet it is the main mitigation measure by the society to the impact of droughts. The response mechanisms to emergency are, due to lack of adequate communication infrastructures in Kanyemba and Mbire as a district, uncoordinated and often times delayed. Centralization of resources and the bureaucratic nature of the Civil Protection Origination's response mechanisms also delays response to disaster events like floods in Kanyemba.

CHAPTER 5

DISCUSSION AND CONCLUSIONS

5.1 Discussion

Floods and drought pose major threats to sustainable development of communities (Gwimbi, 2009). Recurrent drought causes crop failure leading to loss of livelihoods, chronic, recurrent food insecurity and persistent threats of famine (World Bank, 2005). They also have negative impact on potable water supplies with a higher burden on women who collect water for household consumption. Floods damage crops and livestock leading to food insecurity and loss of livelihoods. According to Paul (1998) severity of the impacts of floods and drought on communities depend on the level of development of the communities and mechanism in place to mitigate them. Communities dependent on rainfed agriculture are more vulnerable to drought and floods (Blaikie, 1994). In Kanyemba livelihoods are predominantly based on agriculture. Agriculture in the area is rainfed. Recurrent drought which is a permanent feature of the climate in the area and increased occurrences of floods due to cyclones and also the location of the area in relation Mwanzamtanda and Zambezi Rivers and major Dams of Kariba and Cahora Bassa impact directly on crop production in Kanyemba threatening food security and household wellbeing as over 90% of the population in area crop cultivation for their income and food security. As pointed out by Blaikie (1994), such communities are more vulnerable to floods and drought mainly because of the livelihoods practiced in the area. A combination of high dependence on rainfed agriculture while rainfall is highly variable with recurrent drought and floods leaves the people vulnerable to drought. The occurrence of floods causing damage to crops in the flood plain which have also damaged the irrigation scheme, further pushes people's livelihoods to the edge.

Vulnerability or resilience of communities to impact of floods and drought is also linked to the institutional frameworks in place to support community's response to floods and drought (UNISDR, 2008). The study has found that there are well established institutional frameworks for floods and drought management which is a welcome development. There are legislative frameworks which establish national platforms for floods and drought management and

decentralise them to grassroot level creating a suitable environment for community participation. However, the legislative frameworks are silent and ineffective on prioritizing disaster risk reduction and supporting arrangements for strengthening community capacity building in floods and drought management. Halloway (2003) also found that floods and drought management is highly reactive and relief oriented. Further, devolution of competencies and resources to local community structures is not effectively addressed by the legislative framework. The local institutional structures lack the capacity to effectively support the community mitigate and respond to floods and drought.

The case of floods which were experienced more recently in the area in 2010 clearly shows the weakness in the capacity of the local community structures. Community actors were unable to rescue the flood victims. Centralization of resources leads to uncoordinated and delayed response to rapid onset disaster like flood emergencies (Gwimbi, 2004). UNISDR and UNOCHA (2008) points out that effective floods and drought management requires strengthening local community by decentralizing flood and drought management responsibilities with appropriate skills and resources to the relevant local level structures as the hazards faced and the populations exposed are specific to particular geographic areas (UNISDR and UNOCHA, 2008). Decentralisation of responsibilities and resources not only improve efficiency and effectiveness of response to hazard but also motivate increased local participation (Sahoo, 2005; Kusumasari *et al.*, 2010). According to UNISDR and UNOCHA (2008) local community structures are not only usually the first responders to floods and drought but are also central actors in reducing flood and drought risks. Effective management of floods and drought at all stages of disaster management process: mitigation, preparedness, response and recovery require therefore strengthening the capacity of local community structures (Sahoo, 2005). Floods, for example, are usually accompanied by increased human needs for food and shelter, clothing, clean water and health care and also need for rescue and evacuation. Planning or preparing and responding to floods and drought thus requires regular training of the community actors, and learning between all actors that form part of the community disaster management system, and equipping the structures with the required resources (UNISDR & UNOCHA 2008).

In addition to strengthening to strengthening the capacity of community structures through decentralizing responsibilities and resources, horizontal coordination and linkages at the local level and also vertical coordination with the provincial and national structures is critical for effective response to floods and drought (Bhavnani, *et al.*, 2008). UNISDR and UNOCHA (2008) posit that skilful coordination among the wide range of potential stakeholders involved in disaster management facilitates an effective response of communities to impacts of floods and droughts. UNISDR and UNOCHA (2008) further points out that close and effective coordination requires resources and a clear division of labour that is an institution that is only occupied with disaster management and resources. Coordination and institutional linkages for floods management in the study area however is still weak due to poor communication systems and also lack of representation of DCP with specialised responsibilities of disaster management at lower level.

Another critical issue to effective floods and drought management is strengthening the early warning and information dissemination systems. Early warning information and education to households on how respond to flood and drought risks are central to effective floods and drought management (Gwimbi, 2004). Without effective early warning and awareness systems households in floods and drought prone areas, as put by Gwimbi (2009), may have little option but to suffer the consequences of floods and drought again and again. Although there are efforts made at national level to monitor and forecast floods and droughts, the 'vehicles' through which information is transferred to Kanyemba is limited. Floods and drought early warnings are not timely and there is in regular contacts by the experts with community members. Without proper guidance from experts such as Agritex, and DCP staff on what can be done in response to the early warnings farmers do not benefit much from the warnings in mitigating floods and drought. Early warnings -seasonal floods and drought forecasts- alone offer little benefit to farmer (Blench, 1999). According to Blench(1999) in reality the success stories, where flood and drought forecasts have effectively helped the communities to mitigate the impacts of floods and drought on livelihoods are in places where farmers have had the most useful interactions and dialogue over a spectrum of constraints and risks that farmers confront are shared.

Enhancing indigenous knowledge systems (IKS) is another essential component of effective flood and drought management by the community. As argued by Alverez (2006) quoted in Gwimbi (2009) the tendency to impose first world disaster management systems without regard for indigenous knowledge has lead to disaster management programs being regarded as symbols and not practiced by communities. Community application of local knowledge has the advantage of positively encouraging local community members to address their concerns (Gwimbi, 2009). People in Kanyemba have over the years relied on traditional knowledge to mitigate floods and drought. The traditional knowledge however is at the risk of being washed away as it is not documented and its custodians are passing away. UNEP (2008) points out that IKS are important tools in natural disaster management. The global scientific community also acknowledged the relevance of indigenous knowledge and endorsed it at the World Conference on Science held in Budapest, Hungary, from 29 June to 1 July in 1999. UNEP (2008) points out that IKS play a significant role in complementing science in the conservation of natural resources and management of natural disasters such as floods and drought. National policies for flood and drought management in Zimbabwe however do not explicitly focus on the need to strengthen and preserve the IKS. There is still a gap between the policy, institutional organisations and the community flood and drought management practices.

To be effective therefore there is need to broaden the scope of institutional frameworks to provide for clear linkage through all stages of floods and drought management and provide for arrangement to strengthen the capacity of community structures for flood and drought management.

5.2 Conclusion

The main conclusions of the study are that recurrent floods and drought in Kanyemba impact negatively on crop production which is the major livelihood for households in the community. Reduction of crop yield due to drought and damage to crops by floods threatens household food security and household wellbeing as over 90% of the population in area depends on crop cultivation for their income and food security. Dependence on rainfed agriculture and flood plain cultivation leaves livelihoods susceptible to drought and floods in Kanyemba. There is institutional mechanism to support community management of floods and drought which comprises the legislative framework mainly National Civil Protection Policy, National Policy on Drought Management, Civil Protection Act of 1989; the national platforms mainly Civil Protection Organisation, National Drought Relief Committee; and traditional institutions. However, the institutional framework does not effectively support community management of floods and drought. The devolution of competencies and resources to the community structures in Kanyemba for management of floods and drought is limited. The local institutional structures in Kanyemba lack material, financial, and appropriate training and skills to undertake floods and drought management activities to effectively mitigate the impacts of floods and drought. there is lack of infrastructures and resources for effective coordination mechanisms to link with bodies involved in floods and drought management at local and national level. There are inadequate observatories in Kanyemba for monitoring meteorological and hydrological conditions to accurately forecast floods and drought. In addition the community has difficulties accessing floods and drought early warning in time due inadequate communication systems. The community structures lack emergency facilities and skills to timely respond to emergencies. There is lack of capacity by the local structures to effectively manage floods and drought in Kanyemba community.

5.3 Recommendations

The overarching recommendation of this study is that the resilience of Kanyemba community to floods and drought need to be strengthened. The following are the specific recommendations:

- There is need to provide clear financial provisions for disaster management at community level in the legislation

- There is need to provide clear arrangements in the legislation to build and maintain preparedness and response capacity at community level

- There is need to put a desk (officer) for the Department of Civil Protection within the office of the district administrate at District Civil Protection and planning Committee, to facilitate coordination between District Civil Protection and Planning Committee and the Department of Civil Protection to reduce the bureaucratic nature of the Civil protection Organisation Structure

- There is need for regular training for the community structures to enhance knowledge, skills, and competencies, to implement, monitor, and coordinate flood and drought management activities in the community.

- There is need to provide financial and material resources for emergency preparedness and response – bicycles, communication equipment, phones, sirens, boats to support flood and drought management activities by the community organisations.

- There is need to strengthen monitoring and early warning systems: increase the number of observatories for monitoring meteorological and hydrological conditions and regularly maintain them to obtain real time data for accurate forecasting; research on traditional early warning systems to synchronize them with the scientific early warning systems and then document them and publicize them to the whole community.

- There is need to improve communication systems for early warning dissemination through: collaboration with mobile phone network providers to timely disseminate information and warnings to the community through text messages.

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APPENDICES

Appendix 1: Key informants

	Key informant	organisation
1	Chief in the study area	Chair - Community structure involved in disaster management
2	Kanyemba Ward Councilor	Co-chair - Community structure involved in disaster management
3	CAMPFIRE -Secretary	Secretary-Community based organisation for management of natural resources
4	Village development committee secretary	Secretary -Village structure involved in disaster management
5	Community Based Red Cross Volunteer	Secretary -Team of community Red Cross volunteer invoved in disaster management
6	Christian Care Staff	Staff- Non governmental organisation involved in disaster management in the district
7	Elders in the community	Members of Kanayemab community
8	Community Secondary School Head	Head – govrtment institution in the community
9	Mbire District Administrator	Coordinator - District Civil protection and planning Committee (DCPPC/DDRC)
10	Chief Exective Officer –Mbire rural Distrit Council	Secretary - DCPC/DDRC District Civil protection and planning Committee
11	Agritex officer	Chair of Drought Relief Committee
12	World Vision Officer	Staff- Non Govermental organisation involved in disaster management in the district (member of DCPPC
13	Lower Guruwe Development Association- staff Deputy Director	Deputy directorLocal NGO involved in disaster management in the district
14	Mbire District Vet Officer	Member of DCPC/DDRC
16	Department of Civil protection Officer	Staff –Government Department responsible for Coorniating disaster manageemr in the country (chair of the national platform for civil protection- NCPPC)
17	Meteteorlogical Service Officers	Staff -Member of NCPPC
18	Zimbabwe Red Cross -Officer	Staff -Member of NCPPC
19	International Organisation for Migration Officr	Staff –non governmental organisation -Member of NCPPC
20	Zimbambwe National Water Authority Officers	Member of CPO- NCPPC

Appendix 2: Semi-structured household interviews

Occurrence of floods

1.What are the most important hydro-climatic hazards this community faces?

2. What is the frequency of the occurrence of floods in the community?

Period	**Frequency**
1980- 1990	
1991-1995	
1996-2000	
2001- 2005	
2005- present	

3. When did community experience the most recent floods?

4. Are there particular parts of the community that are vulnerable?

Impact of floods on livelihoods

1.What are the main livelihoods in this area

2. At household level what is most impacted by floods

3.What are the impacts of floods on:

- crop cultivation,
- livestock,
- water supply,
- food security,
- wildlife,
- safari,
- fish camping and
- environment

2. Why do people live in area affected by floods?

Occurrence of droughts

1.What is the rainfall calendar in this area now and how was it in the past

2. What is the frequency of the occurrence of droughts in the community?

Period	**Frequency**
1980- 1990	
1991-1995	
1996-2000	
2001- 2005	
2005- present	

3. When did community experience the most recent droughts?

Impact of droughts on livelihoods

4. How does drought impact on livelihoods in the area?

5. What are the impacts of droughts on:

- crop cultivation,
- livestock,
- water supply,
- food security,
- wildlife,
- safari,
- fish camping and
- environment

6. At household level what is most impacted by droughts

7. How are the following groups affected by droughts?

- women and child headed families,
- people living with HIV?AIDS
- old people
- school going children – especially girls

Summary

Occurrence of droughts/floods	Frequency	People affected	What was impacted
1980- 1990			
1991-1995			
1996-2000			
2001- 2005			
2005- present			

Institutional structure

1. What are the institutions or organizations that are involved in the management of floods and drought in the community?

2. How do they support you to respond to impact of floods and drought?

Floods and drought management mechanisms

Monitoring and early warning

1. What kind of warning do you receive with regard to floods and drought?

2. How often do you receive these warnings?

3. What are the means of communication through which that information reach the community?

4. Does the information come in time?

5. What are the traditional (indigenous knowledge systems) ways of monitoring and forecasting drought in the community?

Mitigation measures

6. How do you respond to the drought and flood warnings?

7. What are the measure that you use to mitigate the impact of floods and drought on your livelihoods?

8. How effective are those measures.

9. How do the institutions or organisations involved in flood and drought management in the community support you to strengthen the measure you use to mitigate floods and drought?

10. What are the challenges/constraints that you face in mitigating the impacts of floods and drought?

Response and recovery

11. In case of a flood or drought event how do you respond? How did you respond to the most recent severe flood/drought in the area?

12. Who came to assist you when you experience a flood disaster or when you experience a drought?

13. What kind of assistance do you receive in case of drought/flood disaster?

14. How do you assess the assistance – was it enough and timely, did it make a difference.

15. Apart from relief assistance how else are you supported to recover from the flood or drought disaster events

16. How did you recover from the most severe flood/drought disaster experienced in the area?

17. What programs or plan do you have for recovery of the affected communities?

18. What are the challenges/constraints in responding to floods and drought?

Impact of the institutional mechanism

1. How have the institutions or organisations involved in flood and drought in the community helped to enhance your resilience to impact of floods and droughts?

Appendix 3: Interview guide: community structure for flood and drought management Kanyemba

Governance

1. What are the structures/ institutions or organizations (governmental or nongovernmental) that are involved in the management of floods and drought in the community?

2. Is there funding for flood and drought management in the community?

3. What is the composition of the local community structures involved in flood and drought management?

4. What are the roles and responsibilities of the institutions involved in floods and droughts management?

5. How often do community structures meet in a season for flood and drought management?

6. Does the local community structure for flood and drought management have the financial and material and the technical knowledge for flood and drought management?

7. What arrangements are there to strengthen the capacity of the local organisation involved in the management of floods and drought?

- financial resources,
- material and
- technical support and
- Training of the personnel involved in flood/drought management,

Monitoring, risk assessment, forecasting, early warning

1. What are the roles of the local community structures in flood monitoring and early warning?

2. Does the local community structure for flood and drought management have the capacity in terms of technical knowledge, resources to monitor, assess flood and drought risk and disseminate early warnings?

3. How do floods and drought early warnings reach the local community structures?

4. What are the means of communication through which that information reach the community?

5. How often do the community structures receive floods and drought warnings?

6. How are warnings disseminated to the households in the community?

7. What are the challenges of dissemination of forecast and early warning?

8. What are the traditional early warning systems in the community?

8. How are they incorporated to the scientific early warning systems?

10. Are they documented?

11. How effective are the early warning systems in the community?

Mitigation measures

1. What is the role of the local structure in supporting the community to mitigate the impacts of floods and drought?

2. What measures taken in the community to mitigate impacts of floods and droughts on

- Crop cultivation
- Livestock rearing
- Water supply

Response and recovery

1. What is the role of the local structure in supporting the community to respond floods and drought events?

2. How did local community structure help the community to you respond to the most recent severe flood/drought in the area?

3. Who was involved in supporting the community responds to most recent floods and drought experienced in the community?

4. What is the role of the local structure in supporting the community to recover from floods or and drought disasters?

5. How did the community recover from the most recent flood and droughts?

6. What are the challenges/constraints responding to floods/drought in the community?

Appendix 4: Interview guide: district structure for flood and management
Institutional framework

1. What are the institutions for flood/drought management at district level?

2. What are the roles of the institutions/organisations that are involved in flood /drought management in the district?

Coordination
3. What is the structure or institution put in place for the overall coordination of various institutions and stakeholders involved in flood/drought management in the country?

4. What mechanism are there to ensure that there are no gaps in the organizational structure for flood/drought management in the district up to the lowest possible level?

5. What are the challenges hindering effective coordination of the institutions and activities in flood/drought management in the district?

Integration

6. How are drought and flood management activities integrated drought and floods management integrated into district development activities?

Capacity

7. Does the institutional framework involved in mitigating and responding to floods/drought have adequate material resources, financial resources and trained personnel to be able to fulfill their roles effectively?

8. What is done or plans in place to strengthen the capacity of the local institutions involved in mitigating and responding to the impact of flood/drought in the district?

9. How best can the capacity of the district structures for preparedness and mitigation ad emergency response be improved

Participation

10. What mechanisms are there to ensure that both men and women are involved in the management of floods and drought in the district?

Resource allocation and funding

11. What is the source of funding for flood and drought management in at district level

Monitoring, risk assessment, forecasting, early warning (preparedness)
12. What are the institutions for flood/drought
- monitoring,
- risk assessment, and
- disseminating the forecasting and early warning to the communities?

13. What are the means of communication through which forecast and early warning for occurrence of floods/drought reach the community?

14. When they are opening the flood gates at Kariba dam how does the information reach the district civil protection committee?

15. What are the means of communication through which that information reach the community?

16. How reliable are such means of communication for early warnings

17. Does the information come in time to allow the community to get prepared/

18. What kind of preparation is done in response to the flood warnings?

19. Does the institutional framework or persons involved in flood and drought monitoring, assessment and disseminating the warning to the communities have adequate

- financial resources,
- material and technical support and
- trained human resource

20. What are the challenges/constraints to monitoring, forecasting and disseminating early warning?

21. How can the monitoring, forecasting and early warning mechanism be strengthened?

Mitigation

22. Is there an institutional mechanism for mitigating the impacts of flood/drought in the district?

23. What are the Institutions/Organizations involved in mitigating the impacts of flood/drought?

24. What are the activities/measures that are put in place or in plan for mitigating the impacts of floods/ droughts on

- Crop cultivation
- Livestock rearing
- Water supply

etc

24. Are there any programs to train the people on how to mitigate the impact of floods/drought in order to build a culture of flood/drought management?

25. Are there enough

- material resources,
- technical support, financial and
- trained human resources for training the people on how to mitigate the impact of floods and droughts?

26. What are the challenges/constraints to the efforts to mitigate the impact of flood /drought?

27. How can such challenges be minimized?

28. What are the lessons learnt from the past efforts to mitigate the impacts of floods/drought in the district?

Response and recovery

28. In case of flood/drought event is there an institutional mechanism for responding to flood/drought disaster at district level?

29. What are the Institutions/Organizations involved in responding to a flood/drought event?

30. What kind of assistance is given to the affected communities in case of drought/flood disaster?

31. Is there enough,

- technical support,
- material support,
- financial and
- trained human resources for responding to a flood/drought disaster at district level?

32. What are the challenges/constraints to the efforts to responding to flood/drought disaster?

33. How can such challenges be minimized?

34. Apart from relief assistance how else do you support the communities to recover from the flood or drought disaster events

32. What programs or plan do you have for recovery of the affected communities?

33. What are the challenges/constraints in mitigating and responding to floods/drought at a district level?

Appendix 5: Interview guide: national structure for flood and management
Policy and legislation Framework (enabling /supportive environment)

1. What is the policy and legislative framework that support management of floods and droughts in the country?

2. How does the policy and legislative framework address the following guiding principles for effective floods and drought management?

- community participation and civil society participation and involvement
- mainstreaming disaster management into development activities
- capacity building – structures in floods and drought management at all level
- decentralization of responsibilities and resources to relevant local authorities
- gender sensitivity mainstreaming gender into floods and drought management
- public – private partnerships
- multi-sectoral approach to floods and drought management

3. Is the institutional architecture for flood and drought management clearly defined/established and supported in the policy and legislative framework?

4. How does the policy and legislative framework address procedures, programs and activities for comprehensive flood and drought management activities?

- Mitigation and preparedness – flood /drought monitoring, forecasting, and early warning
- Response and recovery

5. How does the policy and legislative framework address coordination of flood/drought management?

6. How does the policy and legislative framework address funding for disaster management?

Institutional framework

7. What are the institutions/organisations that are involved in flood /drought management in the country?

8. What are the roles and mandates of the institutions involved in floods /droughts management?

Coordination

9. What is the structure or institution put in place for the overall coordination (vertical and horizontal) of various institutions and stakeholders involved in flood and drought management in the country?

10. What are the challenges hindering effective coordination of the institutions and activities in flood/drought management in the country

11. How does the coordination structure avoid gaps and duplication of efforts in the management of floods and drought from national down to the lowest possible level?

Capacity

12. What are the programs/plans put in place to build capacity(in terms of training, financial resources, material and technical support and human resource) of institutions or stakeholders or persons involved in flood/drought management at all level – national, and local level?

Monitoring, risk assessment, forecasting, early warning (preparedness)

13. Is there a institutional mechanism for flood/drought monitoring, risk assessment, forecasting and early warning?

14. What are the Institutions/Organizations involved in flood/drought monitoring, Risk assessment, forecasting, early warning, information and communication

15. Are there enough material resources, technical support, financial and trained human resources for drought/flood monitoring, risk assessment, forecasting and early warning?

16. What are the challenges/constraints to flood /drought monitoring, risk assessment, forecasting and disseminating early warning to the communities?

17. How can the monitoring, risk assessment, forecasting and early warning mechanism be strengthened?

Mitigation

18. Is there an institutional mechanism for mitigating the impacts of flood/drought?

19. What are the Institutions/Organizations involved in mitigating the impacts of flood/drought?

20. What are the activities/measures that are put in place or in plan for mitigating the impacts of floods/ droughts?

21. Are there any programs to sensitise and train the people on how to mitigate the impact of floods/drought in order to build a culture of flood/drought management?

22. Are there enough material resources, technical support, financial and trained human resources for training and sensitizing the people on how to mitigate the impact of floods and droughts?

23. What are the challenges/constraints to the efforts to mitigate the impact of flood /drought?

24. How can such challenges be minimized?

Response & recovery

25. In case of flood/drought event is there an institutional mechanism for responding to flood/drought disaster?

26. What are the Institutions/Organizations involved in responding to a flood/drought event?

27. What kind of assistance do you give to the affected communities in case of drought/flood disaster?

28. Is there enough, technical support, material support, financial and trained human resources for responding to a flood/drought disaster?

29. What are the challenges/constraints to the efforts to responding to flood/drought disaster?

30. How can such challenges be minimized?

31. Apart from relief assistance how else do you support the communities to recover from the flood or drought disaster events

32. What programs or plan do you have for recovery]] of the affected communities?

33. What are the challenges/constraints in mitigating and responding to floods/drought at a district level?